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Prerequisites Versus Diffusion: Testing Alternative Explanations of Social Security Adoption*

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Social security is one of the most important means by which modern nations protect the welfare of their citizens. Through programs that deal with the hardships of workers' injury, illness, old age, unemployment, and low income, social security attempts to set a minimum standard of living for the sectors of society covered by the programs. In countries with fully developed programs, social security now protects nearly all members of society.

Given the importance of social security, it is hardly surprising that scholars have shown considerable interest in analyzing its evolution. Among the many aspects of social security development, the timing of the first adoption of social security merits particular attention. The circumstances of the first appearance of any policy are inherently interesting, and the first appearance of social security is particularly important because it has represented in many nations a major break with the antiwelfare doctrine of traditional liberalism.

The timing of first adoption has received considerable attention in comparative research on social security.¹ However, this research has gen-

erally used the timing of adoption to explain other aspects of the social security experience of nations, and not as an outcome that is itself to be explained.² The present research is concerned with explaining the timing of the first adoption of social security among the 59 countries which had formal political autonomy with regard to domestic policy at the time of first adoption (see Appendix).

The analysis focuses on two of the most important explanations of social security development: the prerequisites explanation,³ which emphasizes causes of social security development *within* nations, most commonly the level of social and economic modernization; and diffusion, which focuses on the imitation of social security programs *among* nations. These alternative theoretical approaches have received very unequal attention in political research. The prerequisites approach has been widely used, particularly in the area of comparative politics.⁴ By contrast,

George Allen and Unwin, Ltd., 1968); and Koji Taira and Peter Kilby, "Differences in Social Security Development in Selected Countries," *International Social Security Review*, 22 (1969), 139-153.

² In quantitative research, the only exception of which we are aware is a two and a half page analysis in Appendix E-12 in Pryor, *Public Expenditures*. Historical studies such as Gaston V. Rimlinger, *Welfare Policy and Industrialization in Europe, America and Russia* (New York: John Wiley & Sons, 1971) have also attempted to explain timing of adoption.

³ This expression is used loosely here to refer to what Marion Levy has labeled functional and structural prerequisites. In using the expression prerequisites, we are following his distinction between the prerequisites for the appearance of a given phenomenon and the requisites for its continued existence. See Marion J. Levy, Jr., *The Structure of Society* (Princeton: Princeton University Press, 1952), pp. 62-63 and 71-72.

⁴ Examples of cross-national studies that examine various forms of the prerequisites and requisites hypotheses (see footnote 3) with regard to democratic political outcomes are S. M. Lipset, "Some Social Requisites of Democracy: Economic Development and Political Legitimacy," *American Political Science Review*, 53 (March, 1959), 69-105; James S. Coleman, "Conclusion: The Political Systems of the Developing Areas," in Gabriel A. Almond and James S. Coleman, eds., *The Politics of the Developing Areas* (Princeton: Princeton University Press, 1960)

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¹ See Margaret Gordon, *The Economics of Welfare Policies* (New York: Columbia University Press, 1963); Phillips Cutright, "Political Structure, Economic Development and National Social Security Programs," *The American Journal of Sociology*, 70 (March, 1965), 537-550; Phillips Cutright, "Income Redistribution: A Cross-National Analysis," *Social Forces*, 46 (December, 1967), 180-190; Henry Aaron, "Social Security: International Comparisons," in Otto Eckstein, ed., *Studies in the Economics of Income Maintenance* (Washington, D.C.: The Brookings Institution, 1967); Frederick Pryor, *Public Expenditures in Communist and Capitalist Nations* (Homewood, Ill.:

diffusion explanations have received only occasional attention in political analysis, though they have been widely used in other areas of research.⁵

The present study is based on the belief that it is extremely important to bring these alternative explanations together in comparative political analysis. It is important not only on substantive grounds—because they are both plausible expla-

nations of many aspects of political life—but also on methodological grounds. This is due to Galton's problem, the problem that the findings based on the analysis of causal relations within nations (or other units of analysis) may be distorted by the effect of diffusion.⁶ This occurs when the joint diffusion of two or more societal characteristics produces high correlations between them which lead researchers to infer incorrectly that they are causally related. Incorporating hypotheses about diffusion into the analysis in effect turns this problem into an opportunity to consider a type of explanation that has previously received limited attention in political research. We recognize that it may be impossible to test definitively the relative importance of causation within units of analysis, as opposed to diffusion.⁷ The present research has the more modest goal of attempting through a combination of simple tests and the presentation of qualitative evidence to reach tentative conclusions about the relative importance of diffusion as opposed to prerequisites explanations.

It is also hoped that this research will add to the variety of types of diffusion that are considered in diffusion analysis. Some writers have argued that the diffusion approach to the study of modernization has placed excessive emphasis on the spread of innovations from advanced centers to back-

pp. 532-576; Everett E. Hagen, "A Framework for Analyzing Economic and Political Change," in *Development of the Emerging Countries*, ed. Robert E. Asher et al. (Washington, D.C.: The Brookings Institution, 1962) pp. 1-38; Phillips Cutright, "National Political Development: Measurement and Analysis," *American Sociological Review*, 28 (April, 1963), 253-264; Dick Simpson, "The Congruence of Political, Social, and Economic Aspects of Development," *International Development Review*, 6 (June, 1964), 21-25; Hayward R. Alker, Jr., "Causal Inference in Political Analysis," in Joseph Bernd, ed., *Mathematical Applications in Political Science, II*. Arnold Foundation Monographs, XVI (Dallas: Southern Methodist University Press, 1966) pp. 7-37; Deane E. Neubauer, "Some Conditions of Democracy," *American Political Science Review*, 61 (December, 1967), 1002-1009; Marvin E. Olsen, "Multivariate Analysis of National Political Development," *American Sociological Review*, 33 (October, 1968), 699-712; Phillips Cutright and James A. Wiley, "Modernization and Political Representation: 1927-1966," *Studies in Comparative International Development*, 5 (1969-1970). For studies in this tradition using political participation as a dependent variable, see Daniel Lerner, *The Passing of Traditional Society* (Glencoe, Ill.: The Free Press, 1958); Hayward Alker, "Causal Inference in Political Analysis"; Donald J. McCrone and Charles F. Cnudde, "Toward a Communications Theory of Democratic Political Development: A Causal Model," *American Political Science Review*, 61 (March, 1967), 72-79.

⁵References to the idea of diffusion may be found in much political research (see, for example, Gabriel Almond and Sidney Verba, *The Civic Culture* (Boston: Little, Brown and Company, 1965), p. 2, but the number of studies that have presented explicit tests for diffusion is limited. These have included Stewart A. Rice, *Quantitative Methods in Politics* (New York: Alfred Knopf, 1928); Robert L. Crain, "Fluoridation: The Diffusion of an Innovation Among Cities," *Social Forces*, 44 (June, 1966), 467-476; Robert D. Putnam, "Toward Explaining Military Intervention in Latin American Politics," *World Politics*, 20 (October, 1967), 102-3; Jack L. Walker, "The Diffusion of Innovations Among the American States," *The American Political Science Review*, 63 (September, 1969), 880-899; Manus Midlarsky, "Mathematical Models of Instability and a Theory of Diffusion," *International Studies Quarterly*, 14 (November, 1970), 60-84. For a discussion of systematic attempts to examine the role of diffusion in social security adoption, see the discussion later in this article. The literature on diffusion outside of political science is usefully summarized by Everett M. Rogers and F. Floyd Shoemaker, *Communication of Innovations*, 2nd ed. (New York: The Free Press, 1971) and John C. Hudson, *Geographical Diffusion Theory* (Evanston, Ill.: Northwestern University, Department of Geography, 1972).

⁶See Raoul Naroll, "Galton's Problem: The Logic of Cross-Cultural Research," *Social Research*, 32 (Winter, 1965), 428-451; Brian J. L. Berry, "Some Methodological Consequences of Using the Nation as a Unit of Analysis in Comparative Politics," paper prepared for the Committee on Comparative Politics of the Social Science Research Council, 1970; John V. Gillespie, "Galton's Problem and Parameter Estimation Error in Comparative Political Analysis," paper prepared for delivery at the Annual Meeting of the Midwest Political Science Association, Chicago, 1970; and Richard E. Hildreth and Raoul Naroll, "Galton's Problem in Cross-National Studies," paper prepared for the Committee on Comparative Politics of the Social Science Research Council, 1970.

⁷Berry has made this point with particular reference to spatial diffusion. He has argued that whereas "in time series a natural distinction exists between past and future, no such property characterizes spatial series. Dependence will extend in a variety of directions, and often on vectors at angles to the Cartesian grid, leading to elaborate cross-product locational terms. . . . [M]ost of the functions introduced by statisticians into the field of spatial processes have been introduced simply because the mathematics exists, as extensions of time-series analysis, without thought for their usefulness or interpretability. And even more significant, all of the existing models rely on an assumption of stationarity, i.e., that the relation between values of the processes is the same for every pair of points whose relative positions are the same. This is patently invalid." See Brian J. L. Berry, "Problems of Data Organization and Analytical Methods in Geography," *Journal of the American Statistical Association*, 36 (September, 1971), 521.

ward peripheral areas.⁸ One of the subpatterns of diffusion which is examined in the present research—diffusion from a somewhat less advanced country to progressively more advanced countries—represents an entirely different pattern through which an innovation can spread. The presentation of this finding may suggest to other researchers opportunities for analyzing less conventional patterns of diffusion.

In focusing on the timing of social security adoption, this research also addresses the issue of the timing and sequence of different aspects of modernization. Several writers have recently attempted to measure the timing of certain aspects of modernization,⁹ and a number of authors have explored hypotheses regarding the sequence in which different aspects of modernization occur.¹⁰

⁸ See Susanne J. Bodenheimer, *The Ideology of Developmentalism: The American Paradigm-Surrogate for Latin American Studies*. Sage Professional Papers in Comparative Politics, Vol. 2 (Beverly Hills, Cal.: Sage Publications, 1971), pp. 22ff and A. Eugene Havens, "Methodological Issues in the Study of Development," paper prepared for delivery at the Third World Congress of Rural Sociology, Baton Rouge, Louisiana, August, 1972.

⁹ See W. W. Rostow, *The Stages of Economic Growth* (London: Cambridge University Press, 1960), p. 38, and *Politics and the Stages of Growth* (London: Cambridge University Press, 1971), p. 55; C. E. Black, *The Dynamics of Modernization: A Study in Comparative History* (New York: Harper and Row, 1966), pp. 90ff; Arthur S. Banks and Robert B. Textor, *A Cross-Polity Survey* (Cambridge: The M.I.T. Press, 1963), pp. 78–80; Steven L. Barsby, "Economic Backwardness and the Characteristics of Development," *Journal of Economic History*, 29 (September, 1969), 449–473; Fernando H. Cardoso and Jose Luis Reyna, "Industrialization, Occupational Structure, and Social Stratification in Latin America" in *Constructive Change in Latin America*, ed. Cole Blasier (Pittsburgh: University of Pittsburgh Press, 1968), pp. 25–26; and David Collier, "Timing of Economic Growth and Regime Characteristics in Latin America," *Comparative Politics*, 7 (April, 1975), 331–360.

¹⁰ See, for instance, Eric A. Nordlinger, "Political Development: Time Sequences and Rates of Change," *World Politics*, 20, No. 3 (April, 1968), 494–520; Peter Heintz, *Ein Soziologisches Paradigma der Entwicklung* (Stuttgart: Ferdinand Enke Verlag, 1969); Richard A. Pride, *Origins of Democracy: A Cross-National Study of Mobilization, Party Systems and Democratic Stability*, Sage Professional Papers in Comparative Politics Vol. 1 (Beverly Hills, Cal.: Sage Publications, 1970); Sidney Verba, "Sequences and Development," in *Crises and Sequences in Political Development*, ed. Leonard Binder et al. (Princeton: Princeton University Press, 1971), pp. 283–316; Robert A. Dahl, *Polyarchy* (New Haven: Yale University Press, 1971); William Flanagan and Edwin Fogleman, "Patterns of Political Development and Democratization: A Quantitative Analysis," in *Macro-Quantitative Analysis*, ed. John V. Gillespie (Beverly Hills, Cal.: Sage Publications, 1971), pp. 441–473 and "Patterns of Democratic Development: An Historical Comparative Analysis," in Gillespie and Nesvold, pp. 475–497.

The present research demonstrates that there are systematic variations in the sequence of social security adoption in relation to other aspects of modernization. The most important overall relationship is the tendency for later adopters to adopt at far lower levels of social and economic modernization. It is argued that this tendency is in part an aspect of the more general tendency toward a larger role of the state in later developing countries, and that it is also due to certain special characteristics of social security as a public policy.

The Development of Social Security

Social security is generally considered to consist of five distinct programs which provide cash payments to individuals to replace income lost as a result of injury related to employment, sickness and maternity, old age, and unemployment, and to supplement income for families with children, usually, though not always, on the basis of need. In many countries, medical services are provided directly by the state in place of the system of cash reimbursements for medical expenses. Social security differs from the many types of private insurance arrangements, according to standard definitions, in that it is initiated by the state, although it may not be administered or financed entirely by the state.¹¹ Following the example of most comparative analyses of social security, this research does not consider insurance programs maintained by the state for its own employees.

Although social security first appeared in Europe at the end of the last century, its origins must be seen within the context of growing state intervention in private mutual aid societies in the nineteenth century.¹² Mutual aid societies are known to have existed as early as ancient Grecian times and have been present in Western Europe from the Middle Ages and down to the present day.¹³ They have ranged greatly in size and scope: some have consisted of groups of neighbors who set aside a small sum each week to cover funeral expenses,¹⁴ while others have counted their membership in the thousands and provided not only

¹¹ This is a paraphrase of the definition found in U.S. Department of Health, Education and Welfare, Social Security Administration, *Social Security Programs Throughout the World, 1971* (Washington, D.C.: Government Printing Office, 1971), p. ix.

¹² For a detailed discussion of the early development of social security, see Vladimir Rys, "The Sociology of Social Security," *Bulletin of the International Social Security Association*, 17, No. 1 (January-February, 1964), 3–34; and Rimlinger, *Welfare Policy and Industrialization*.

¹³ Rys, "The Sociology of Social Security," p. 6.

¹⁴ J. M. Baernreither, *English Associations of Working Men* (London: Swan Sonnenschein & Co., 1889, republished in 1966 by Gale Research Company, Detroit), p. 165.

burial expenses, but sickness and accident insurance as well.

As the size of the industrial labor force began to grow in the eighteenth and nineteenth centuries in Europe, these societies grew as well, both in size and number. This proliferation brought an increasing number of cases in which, because of mismanagement or fraud, societies went bankrupt and the contributors lost their equity. As bankruptcies continued, government regulation of the funds began to appear. While the type of regulation varied from country to country, it generally included an audit to insure that the funds were actuarially sound. In some cases where regulation was not mandatory, incentives such as free postage or tax exemptions were given to those funds which accepted it.¹⁵ In other cases, state intervention went even further in relation to certain dangerous occupations, such as mining. For instance, an 1854 law in Prussia made membership in mutual aid funds compulsory for all workers in mines, quarries, and salt works.¹⁶

According to the definition cited above, which identifies social security programs as insurance schemes that are *initiated*, and not merely regulated or required, by public law, social security first appeared in Germany in 1883 with the adoption of a program to cover the costs of sickness and maternity. A work injury program was adopted a year later, and a pension program in 1889.¹⁷ Other programs have been slower in coming, even in Germany. Unemployment insurance was enacted in 1927, and family allowances were established in the German Democratic Republic in 1950 and in the Federal Republic of Germany in 1954.

This pattern of gradual development of social security has characterized all aspects of program growth. For instance, it has taken seven decades for work-injury programs—generally the first program to be adopted in each country—to spread to all 59 countries considered in this study. The appearance of other programs within each country and the broadening of the coverage of existing programs has also occurred gradually. Even in the most advanced countries, additions to the scope of coverage and the type of benefits offered continue to occur.¹⁸

¹⁵ U.S. Department of Commerce and Labor, *Twenty-Fourth Annual Report of the Commissioner of Labor, 1909. Workmen's Insurance and Compensation Systems in Europe* (Washington, D.C.: U.S. Government Printing Office, 1911), p. 8.

¹⁶ Robert Morse Woodbury, *Social Insurance: An Economic Analysis* (New York: Henry Holt & Co., 1917), p. 8.

¹⁷ These and other dates are from U.S. Department of Health, Education, and Welfare, *Social Security Programs*.

¹⁸ For an excellent discussion of this phenomenon of gradual growth in Latin America see "Gradual Ex-

The Timing of Social Security Adoption

The principal variable used in this analysis is the timing of the adoption of the first social security program in each country. The dates for first adoption were taken from *Social Security Programs Throughout the World, 1971*.¹⁹ The use of this source follows the precedent set by Aaron, Pryor, and Taira and Kilby, who derived measures of program age solely on the basis of the date of first adoption, and by Cutright, who constructed a measure of cumulative social security experience that is closely related to it.²⁰

Because this study focuses on the first adoption of social security, it is appropriate to assess the extent to which the timing of first adoption is closely related to the timing of the emergence of other aspects of social security.²¹ The examination of evidence about social security development reveals, not surprisingly, considerable variation in the way that social security first appears in each country. In some cases, initial laws with relatively wide coverage are quickly followed by additional programs in a pattern of rapid social security development. In other cases, a first law of limited coverage may be passed which is not followed by additional legislation for many years.

The data show, however, that the development of social security follows a surprisingly consistent pattern in which the different aspects of development are closely interrelated. For instance, the five different types of programs are adopted in a remarkably consistent order, to such an extent that the pattern of adoption among nations forms a Guttman Scale.²² The correlations between the date of first adoption and the dates of adoption of the five types of programs are also high. Since the first program is usually work injury, the correlation with that program is nearly perfect, .98. The correlations of first adoption with pensions, sickness and maternity, unemployment, and family allowance are .79, .74, .53, and .22 respectively. The low correlation for the last program may be

tension of Social Insurance Schemes in Latin American Countries," *International Labour Review*, 68 (September, 1958), 257-283.

¹⁹ U.S. Department of Health, Education, and Welfare (Washington, D.C.: U.S. Government Printing Office, 1971). The limitations of this source are discussed in the Appendix.

²⁰ See Aaron, "Social Security"; Fredrick Pryor, *Public Expenditures*; Taira and Kilby, "Differences in Social Security Development;" and Cutright, "Political Structure, Economic Development and National Social Security Programs" and "Income Redistribution."

²¹ The procedure followed here is that recommended by Przeworski and Teune for confirming the reliability of an indicator. See Adam Przeworski and Henry Teune, *The Logic of Comparative Social Inquiry* (New York: John Wiley and Sons, 1970), pp. 114-115.

²² Cutright, "Political Structure, Economic Development and National Social Security," p. 540.

explained by the qualitatively different issues involved in family allowance programs.²³

Timing of first adoption is related to other aspects of social security as well. Cutright, Aaron, Pryor, and Taira and Kilby have all found that indicators based on the timing of adoption are strongly correlated with present level of social security spending as a percentage of gross national product, with the earlier adopters having consistently higher levels of spending.²⁴ Among the countries considered in the present study, the correlation with the percentage of the gross national product devoted to social security in 1960 is $-.81$.²⁵ The timing of first adoption is also strongly related to the proportion of the population that is covered by social security. For the two programs for which reasonably complete data are available—work injury and pensions—the correlations are $-.77$ and $-.71$, respectively.²⁶

Available data thus suggest that first adoption is strongly related to several other important aspects of social security development. This provides a firmer basis for arguing that the timing of first adoption is a valid indicator of the timing of over-all social security development and does not represent just an isolated aspect of it.²⁷

²³ See J. Henry Richardson, *Economic and Financial Aspects of Social Security: An International Survey* (Toronto: University of Toronto Press, 1960), pp. 139–155 for a discussion of the issues involved in family allowance programs.

²⁴ See Cutright, "Income Redistribution;" Aaron, "Social Security"; Pryor, *Public Expenditures*; and Taira and Kilby, "Differences in Social Security Development." It should be noted that whereas these correlations are treated, in the present research as a means of assessing the validity of an indicator these authors have used them to examine causal relations among different aspects of social security experience.

²⁵ The negative sign of this correlation and the two others reported in the next paragraph results from the fact that timing of adoption is measured by the year of adoption, and hence involves a smaller number for the earlier adopters. The measure of spending is taken from *The Cost of Social Security*, published by the International Labor Organization (Geneva: 1967). This correlation is based on data on 34 countries.

²⁶ The data on coverage are taken from International Labor Office *The Yearbook of Labor Statistics, 1961* (Geneva, 1961). The correlation for work injury is based on 27 cases, and that for pensions on 30 cases.

²⁷ Probably the most important aspect of social security development—the quality of the benefits offered to those who are covered—is extremely difficult to measure. One might hypothesize that timing of adoption and quality of services are strongly associated, but that as one moves from earlier to later adopters, the lag between the first adoption of programs and the growth in the quality of programs would be greater and greater. Wolf's discussion of the quality of services in Latin America—a region in which the first adoption occurred nearly three decades after the first adoption in Germany—would appear to support this hypothesis. He suggests that dilution of the quality of service, long delays in insurance pay-

Prerequisites Explanations of Social Security Development

The prerequisites approach treats the development of social security as a result of the social and economic transformations associated with the transition from primarily agricultural to industrial economies. Within this perspective, one of the most important hypotheses is that the decline in the proportion of the work force in agriculture increases the need for social security. Pryor argues that "although agricultural workers have considerable welfare needs, they can make certain provisions for such purposes that are non-monetary in nature and that are unavailable for those who have left the land."²⁸ Food and shelter are more readily acquired through nonmonetary means in agricultural settings, and it is easier to make nonmonetary provisions for sickness and old age in an agricultural setting in which extended family networks are often of greater importance. There unquestionably exist types of agricultural laborers for whom these nonmonetary means are not available, and the extent of the decay of extended family networks in cities has at times been exaggerated. Nevertheless, there are important differences in the availability of these nonmonetary provisions in rural as opposed to urban areas.²⁹

Other writers have focused on the growth of industry as a crucial factor in the development of social security. Cutright argues that the percentage of the work force in industry is an indicator of the vulnerability of the population to drastic changes in income arising from unemployment.³⁰ Organski also emphasizes the importance of industrialization, both because it provides the opportunities for organization and leadership

ments, and wide-spread corruption and bribery are found even in the most advanced countries in Latin America. See Marshall Wolfe, "Social Security and Development: The Latin American Experience," in *The Role of Social Security in Economic Development*, ed. Everett M. Kassalow (Washington, D.C.: U.S. Department of HEW, Social Security Administration, Research Report No. 27, 1968), pp. 155 and 165.

²⁸ Pryor, *Public Expenditures*, pp. 134–135.

²⁹ For a useful discussion of the literature that has overstated the importance of the transition for rural to urban life, see Wayne A. Cornelius, Jr., "The Political Sociology of Cityward Migration in Latin America: Toward an Empirical Theory," in *Latin American Urban Research, I*, Francine F. Rabinovitz and Felicity M. Trueblood, eds. (Beverly Hills, Cal., Sage Publications, 1971) pp. 95–150. In the present context it is important to note that opportunities for non-monetary provisions of certain types may be present in cities. See, for instance, William Mangin's "Latin American Squatter Settlements: A Problem and a Solution," *Latin American Research Review*, 2, No. 3 (Summer, 1967), 65–98.

³⁰ Cutright, "Income Redistribution," p. 184.

that make it possible for workers to demand protection, and because it provides the higher productivity that makes social security financially possible.³¹

Pryor's finding that labor union strength is related to the timing of the adoption of social security appears to give support to the first of these hypotheses.³² The relationship between productivity and social security is more complex, but also appears to support Organski's argument. Measuring productivity as gross national product per capita, Pryor finds that social security spending is related to productivity only if the sample of nations includes the entire range of economic modernization. If only the semi- or fully-developed economies are considered, there is no relationship. A similar finding emerges in Pryor's time-series analysis, and Taira and Kilby actually find a negative relationship among the most advanced countries.³³ Pryor interprets his findings by suggesting that productivity is an underlying, but not an immediate determinant of expenditures.³⁴ It would appear that increases in productivity at earlier levels of modernization produce more spending, but that variation in productivity makes no difference once it has gotten above a certain level. Since the first adoption of social security generally occurs at the lower levels of modernization, however, it appears that productivity may be a relevant explanation for first adoption.

The argument that the need for old-age pensions increases as economic modernization proceeds is also part of the prerequisites thesis. Pryor notes that the proportion of the population over 65 increases as per capita income rises, thereby increasing the need for pensions.³⁵ Rimlinger argues with reference to the United States that in addition to a change in the age composition of the population, the difficulty of accommodating older workers in mass production organization also increases the need for pensions as economic development proceeds.³⁶ Aaron specifically suggests that the aging of the population may be one factor that explains the timing of adoption.³⁷

Another important theme in the social security literature—the human capital argument—may also be subsumed under the heading of prerequi-

sites explanations. This is the argument that as the capital equipment used in industry becomes more complex and more expensive, it is important to make a concomitant investment in human capital as well.³⁸ A recent study has suggested that greater investments in the welfare of workers actually increase productivity only at the middle levels of modernization.³⁹ Nonetheless, it is widely believed that there is a link between the welfare of workers and productivity, and the human capital argument has often been used by social security advocates because of its obvious appeal to the self-interest of employers.⁴⁰

In examining prerequisites explanations of social security adoption, it is important to assess the kinds of assumptions that this approach requires. It might first be emphasized that it need not require the assumption that all nations will adopt social security at precisely the same level of modernization. A more realistic application of the prerequisites thesis might distinguish between the idea that a particular threshold level of modernization is a necessary, but not a necessary *and* sufficient, condition for adoption. If it is only a necessary condition, one would expect that cases of adoption below a certain threshold of modernization would be rare, but that nations might vary over a considerable range above the threshold in their level of modernization at adoption. If, however, a particular threshold level is both a necessary *and* sufficient condition, adoption should cluster closely around that level.

We must emphasize that the prerequisites thesis does not require a simplified conception of modernization. The departure of workers from agriculture, their entry into industry, increases in productivity, and many other changes that influence the likelihood of social security adoption may occur in a different order, or to differing degrees, in particular countries, and some of them may never occur at all in certain nations. The prerequisites argument does not assume that they necessarily occur together, but rather that to the extent that one or a combination of them does occur, the adoption of social security becomes more likely.

It is, however, an implicit assumption of much comparative research that has dealt with the prerequisites theme that causal relations exist only within nations. This is not because these writers explicitly reject diffusion, but rather because the statistical procedures employed in much of this

³¹ A. F. K. Organski, *The Stages of Political Development* (New York: Alfred K. Knopf, 1965), p. 162.

³² Pryor, *Public Expenditures*, p. 474.

³³ *Ibid.*, pp. 145–146 and Taira and Kilby, "Differences in Social Security Development," p. 142.

³⁴ Pryor, p. 146.

³⁵ *Ibid.*, p. 135.

³⁶ Rimlinger, *Welfare Policy and Industrialization*, p. 209.

³⁷ Aaron, "Social Security," pp. 32–33.

³⁸ See Rimlinger, pp. 103–104.

³⁹ Walter Galenson, "Social Security and Economic Development: A Quantitative Approach," *Industrial and Labor Relations Review*, Vol. 21, No. 4 (July, 1968), 559–569.

⁴⁰ Gaston V. Rimlinger, "Welfare Policy and Economic Development: A Comparative Historical Perspective," *Journal of Economic History*, 26 (December, 1966), 568.

research require the assumption of independence among units if erroneous conclusions are to be avoided. This difficulty of comparative research—called Galton's problem—has been noted earlier. One means of confronting this problem is to make diffusion explicitly part of the analysis. Analysts of social security can readily deal with this methodological problem by turning to the analysis of diffusion, since the qualitative literature on social security has already devoted considerable attention to diffusion effects.

Diffusion Explanations of Social Security Adoption

The diffusion approach views social security adoption as taking place within an international system of communication and influence. As Rys has pointed out, since “. . . no modern State exists in splendid isolation, independent of the international community that surrounds it, the study of factors which influence the establishment of social insurance in a country will necessarily have to go beyond the frontiers of a national community and be considered also at the international level.”⁴¹

A few examples from the literature on social security may serve to illustrate the types of imitation that occur. One type involves cases in which nations have directly imitated the legislation of other countries. For instance, the Italian insurance system for workers' pensions and sickness established in 1898 is a synthesis of corresponding laws in France and Belgium, and the first programs in Austria were modeled after those in Germany.⁴² This latter imitation involved not only the overall form of the program, but technical details as well.⁴³

In other cases that do not involve direct imitation, existing programs have had an important influence on new adopters. Lloyd George, who played a considerable role in the adoption of some of the early programs in the United Kingdom, is known to have been greatly influenced by the programs previously adopted in Germany and Belgium.⁴⁴ Various groups in the United States commissioned studies of European social security systems with the purpose of appraising the feasibility of social security in the United States. This included a 2,749-page, two-volume study of European systems of workers' insurance and

compensation published in 1911 by the U.S. Commissioner of Labor “in response to the very great demand in this country at the present time for information concerning all aspects of this subject.”⁴⁵ Though it was many years before social security was adopted on the national level in the United States, the European experience had considerable influence on programs adopted at the state level.

International organizations and international agreements concerning reciprocity of benefits also play a role in the diffusion of social security. For instance, as a result of a reciprocal agreement with France, Belgium was forced to revise its entire social security system to bring it up to the French standard.⁴⁶ The activities of the Correspondence Committee of the International Labor Organization played a major role after the First World War in spreading the idea of social security from Europe to other parts of the world and supporting the consolidation of the already existing systems.⁴⁷ Since that time, the activities of groups such as the International Social Security Association, the Ibero-American Social Security Organization, and the Inter-American Social Security Conference have promoted the standardization of social security legislation.

Although the literature on social security provides considerable evidence that diffusion is present, only limited attention has been given to systematic analyses of patterns of diffusion. Pilcher, Ramirez, and Swihart have studied diffusion effects in the selection of the normal age for retirement under national pension programs, analyzing such factors as the influence of nations on their neighbors, common language, and colonial experience.⁴⁸ The strongest relationship appears for common language, with mixed results for the other two factors. Taira and Kilby have shown that geographical location may be important in social security development.⁴⁹ They find clear dif-

⁴⁵ U.S. Department of Commerce and Labor, *24th Annual Report*, p. xv. The National Association of Manufacturers sent a group to Germany in 1909 to study the social insurance system there, and the Russell Sage Foundation also sponsored a study of European systems of social insurance in 1908. See Rimlinger, “Welfare Policy and Economic Development,” p. 566 and Lee K. Frankel and Miles M. Dawson, *Workingmen's Insurance in Europe*, (New York: Russell Sage Foundation, 1910).

⁴⁶ U.S. Department of Commerce and Labor, *24th Annual Report*, p. 25.

⁴⁷ Isabel Craig and Igor Tomes, “Origins and Activities of the ILO Committee of Social Security Experts,” *International Social Security Review*, 22 (1969), 509.

⁴⁸ Donald M. Pilcher, Charles J. Ramirez, and Judson J. Swihart, “Some Correlates of Normal Pensionable Age,” *International Social Security Review*, 21, 3 (1968), 387-411.

⁴⁹ Taira and Kilby, “Differences in Social Security Development,” p. 143.

⁴¹ Rys, “The Sociology of Social Security,” p. 4.

⁴² U.S. Department of Commerce and Labor, *24th Annual Report*, pp. 1862-1863 and V. Klumpar, “The Investment of Social Insurance Funds,” *International Labor Review*, 27 (January, 1933), 53.

⁴³ U.S. Department of Commerce and Labor, *24th Annual Report*, p. 44.

⁴⁴ Thomas Jones, *Lloyd George* (Cambridge, Mass.: Harvard University Press, 1951), pp. 36-37.

ferences between countries in the European Common Market, other European countries, and non-European countries in levels of spending for social security.

The present research considers two patterns of diffusion that have received considerable attention in the general literature on diffusion: hierarchical and spatial. In the case of hierarchical diffusion, innovations appear in the most advanced or largest centers and are then adopted by successively less advanced or smaller units. Hierarchical diffusion has been observed for innovations as diverse as radio stations, trolley cars, electronic technology, policy innovations among the states of the United States, the diffusion of fluoridation among cities in the United States, and the diffusion of fire brigades and Rotary Clubs in Chile.⁵⁰ Hierarchical diffusion has also received considerable attention in research on diffusion among individuals, and Rogers has noted the consistent finding that earlier as opposed to later adopting individuals are more educated and of higher social status.⁵¹

Various causes of the hierarchical pattern may be identified. Larger or more developed units may be more disposed to innovations because they have more resources with which to experiment. They tend to have more information about and more contact with other units, and hence are likely to receive more information about an innovation once it begins to spread.⁵² It might also be argued that smaller, less advanced units to some degree consciously adjust their behavior to larger, more advanced units, following a pattern of "positioning behavior" in which they are constantly imitating the behavior of the units that they have chosen as models.⁵³ This involves a pattern that is in a sense an extension of the two-step flow of communication described by Katz and Lazarsfeld and the queuing behavior among legislators discussed by Matthews and Stimson.⁵⁴

⁵⁰ See Berry, "Problems of Data Organization," and Berry and Elaine Neils, "Location, Size and Shape of Cities as Influenced by Environmental Factors: The Urban Environment Writ Large," in *The Quality of the Urban Environment*, Harvey S. Perloff, ed. (Washington, D.C.: Resources for the Future, Inc., 1971); John E. Tilton, *International Diffusion of Technology: The Case of Semiconductors* (Washington: The Brookings Institution, 1971); Walker, "The Diffusion of Innovations Among the American States"; Crain, "Fluoridation," p. 572; and Paul O. Pedersen, "Innovation Diffusion Within and Between National Urban Systems," *Geographical Analysis* (July, 1970), pp. 203-254.

⁵¹ Rogers and Shoemaker, *Communication of Innovations*, p. 186.

⁵² Walker, "The Diffusion of Innovations," p. 885.

⁵³ The expression *positioning behavior* was suggested by Jack Walker in a personal communication.

⁵⁴ Elihu Katz and Paul F. Lazarsfeld, *Personal Influence* (Glencoe, Ill.: The Free Press, 1955) and Donald R. Matthews and James A. Stimson, "Deci-

An alternative type of diffusion is spatial diffusion: diffusion along lines of spatial proximity or, alternatively, along major lines of communication. There is a wide variety of possible lines of spatial communication, and the present research will only illustrate possible patterns and will not attempt to demonstrate definitively the relative importance of spatial as opposed to hierarchical diffusion. Indeed, hierarchical and spatial patterns may be closely interrelated, since economic growth itself has to a considerable degree diffused over a regular, spatial pattern. For this reason, diffusion that is ordered in terms of a hierarchy of economic growth may be spatially ordered as well.

A Test of the Prerequisite Thesis

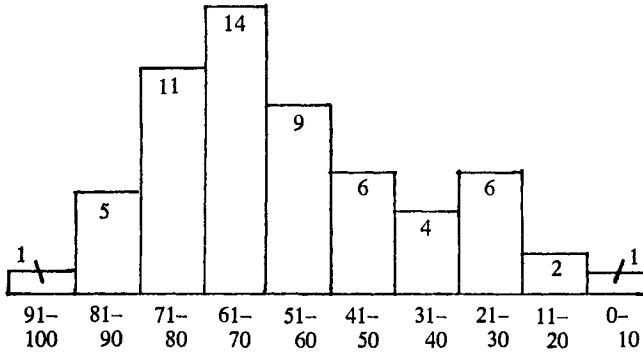
Under the heading of prerequisites explanations, a series of modernizing changes have been identified that presumably increase the likelihood that a nation will adopt social security. Two interpretations of the prerequisites thesis were suggested. On the one hand, it may be argued that it identifies only a necessary condition for adoption and that while countries would never fall below a given level of modernization at the time of adoption, there will actually be a wide variation above that level in the degree of modernization at adoption. Alternatively, there may be a certain level of modernization that is both a necessary and sufficient condition for adoption, such that adoption will tend to occur at roughly the same level of modernization in many or all countries.

Ideally, one would like to examine all of the characteristics of nations at the time of adoption that are suggested by the prerequisites arguments. However, because of the problem of finding data for the wide range of dates represented among the years of adoption,⁵⁵ sufficient data were available only for percentage of work force in agriculture, percentage of work force in industry, and real income per capita. The definition and sources of these measures are presented in the Appendix. In the following pages, the expression "level of modernization" is used to refer to these three indicators.

Table 1 shows the distribution of values for these three variables at the time of first adoption

sion-Making by U.S. Representatives: A Preliminary Model," in *Political Decision-Making*, ed. S. Sidney Ulmer (New York: Van Nostrand Reinhold Co., 1970), pp. 22-23.

⁵⁵ Even such outstanding sources as Stein Rokkan and Jean Meyriat, *International Guide to Electoral Statistics, Vol. 1: National Elections in Western Europe* (The Hague: Mouton, 1969), a major source of data on electoral participation, do not provide data on variables such as the proportion of the population voting in elections for enough countries at the appropriate points in time to permit any meaningful analysis.

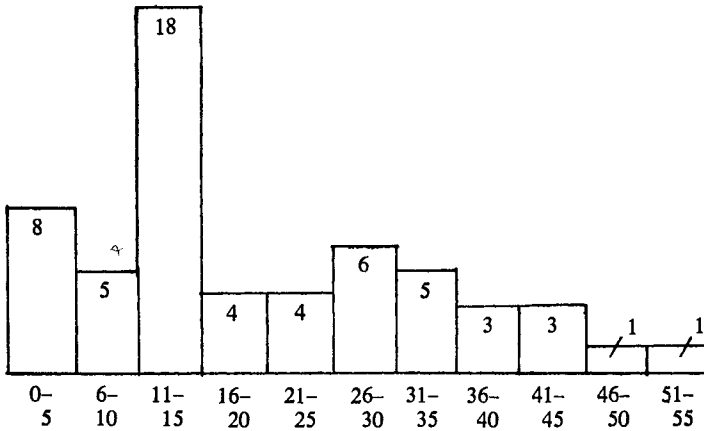


Range

91 to 9

N = 59

Percentage of the Work Force in Agriculture

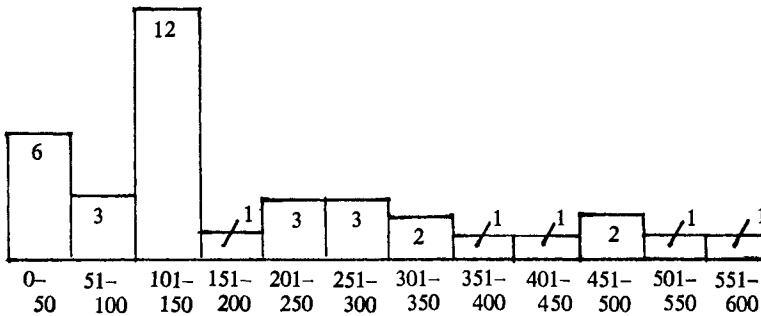


Range

3 to 54

N = 58

Percentage of the Work Force in Industry



Range

19 to 591

N = 36

Real Income per Capita
(Expressed in U.S. dollars around 1930)

Table 1. Distribution of Level of Modernization at First Adoption of Social Security

of social security in each country. For work force in agriculture, there is clearly a clustering around a modal value, and for work force in industry and national income there is a small range (the third column in each case) that contains a substantial proportion of the cases. The range of variation is so wide for all three variables, however, that it appears to disconfirm the necessary and sufficient

condition version of the prerequisites argument. The percentage of the work force in agriculture at the year of first adoption ranges from nine per cent for the United Kingdom to 91 per cent for Saudi Arabia. Work force in industry ranges from three per cent for El Salvador to 54 per cent for Switzerland. Real income per capita, measured in units roughly equivalent to U.S. dollars around

1930, varies from 19 dollars for Ethiopia to 596 dollars for the United States and 504 dollars for the next wealthiest adopter, the United Kingdom.

The alternative interpretation of the prerequisites argument—that level of development is a necessary but *not* sufficient condition for adoption—is more strongly supported by these data, since for each variable there is a level below which few adoptions occur. There were no adoptions in countries with more than 91 per cent of their work force in agriculture, and only six countries had more than 80 per cent in agriculture at adoption. Work force in industry was as low as three per cent at adoption, yet there is a sharp increase in the number of cases in the 11 to 15 per cent range. For real income per capita, the lowest value is 19 dollars, with two other countries adopting at only slightly higher levels. Since the reader may be more familiar with income data expressed in terms of a more recent period, it may be noted that one 1930 dollar is worth about 2.7 1960 dollars.⁵⁶ The lowest level of income at adoption is thus 51 in terms of 1960 dollars. Though still very low, this figure gives a bit more support to the idea that there is a minimum level below which adoption does not occur. This level of modernization is so low, however, that the necessary condition version of the prerequisites argument would seem to have little explanatory power.

On the basis of this simple test, it therefore appears that the prerequisites argument, at least by itself, does not provide an adequate explanation of social security adoption. Other indicators of modernization might be found which produce better results, or there may be complex interactions among different aspects of modernization which, if properly represented in the test, would allow a better prediction of the timing of adoption. The analysis of diffusion, however, may provide a far simpler means of finding order in the apparent diversity of circumstances of social security adoption.

A Test for Hierarchical Diffusion

Considering first the possibility of hierarchical diffusion, a simple test is to examine the relationship between timing of adoption and level of modernization at adoption. If a pattern of diffusion is present in which countries tend to imitate other countries that are at higher levels of modernization, this should be reflected in a tendency for each successive adopter to adopt at a progressively lower level of modernization.

The tendency for later adopters to adopt at lower levels of modernization is shown clearly in

Figure 1, where modernization is measured as the percentage of the work force in agriculture.⁵⁷ Since the level of modernization is defined in terms of the year of adoption, this relationship does not really involve a prediction of the timing of adoption on the basis of level of modernization. Nonetheless, treating the variable measuring year of adoption as an interval scale, a correlation coefficient may be used to summarize the degree of consistency in the relationship. The correlation, and hence the standardized regression coefficient, is .61, reflecting a fairly strong tendency for later adopters to be less modernized at the time of adoption. Similar relationships appear if one uses the other two measures of modernization, except that the correlations have opposite signs because of the opposite polarity of the variables: $-.61$ for work force in industry, and $-.35$ for real income.⁵⁸ The lower correlation for real income may be due in part to the greater difficulty in comparing levels of income because of the effects of inflation and fixed exchange rates.

This tendency for social security to appear at an earlier stage of modernization among later developers doubtless arises in part from the desire noted by Rys for governments in the developing countries

to prove that they can give their populations the same protection other nations give to theirs, and in so doing only follow the general imperatives of social policy in any modern state.⁵⁹

Lund has similarly noted the tendency for leaders in Third World countries to introduce social security out of a wish to acquire for their nations all of the most visible signs of national modernity.⁶⁰ A similar tendency has been noted with

⁵⁷ This method of illustrating the relationship between development and timing of adoption is similar to that used by quantitative geographers who have analyzed the diffusion of innovations among urban centers by plotting size of urban center at the time of adoption by the year of adoption for various types of innovations. See Berry, "Problems of Data Organization and Analytical Methods in Geography," p. 521; Berry and Neils, "Location, Size, and Shape of Cities," p. 299; and Pedersen, "Innovation Diffusion Within and Between National Urban Systems," pp. 209-212.

⁵⁸ Although there is considerable disagreement about the relevance of tests of significance for interpreting correlations in nonsample data, we will present them for readers who find them useful. These correlations for work force in agriculture and work force in industry are significant at the .01 level. That for real income is significant at the .02 level.

⁵⁹ Vladimir Rys, "Comparative Studies of Social Security: Problems and Perspectives," *Bulletin of the International Social Security Association*, Nos. 7-8 (July-August, 1966), 242-268, at p. 245.

⁶⁰ Michael S. Lund, *Comparing the Social Policies of Nations: A Report on Issues, Methods, and Resources* (Center for the Study of Welfare Policy, University of Chicago, 1972), p. 42.

⁵⁶ This coefficient is derived from the *Economic Report of the President, 1972* (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 247-253.

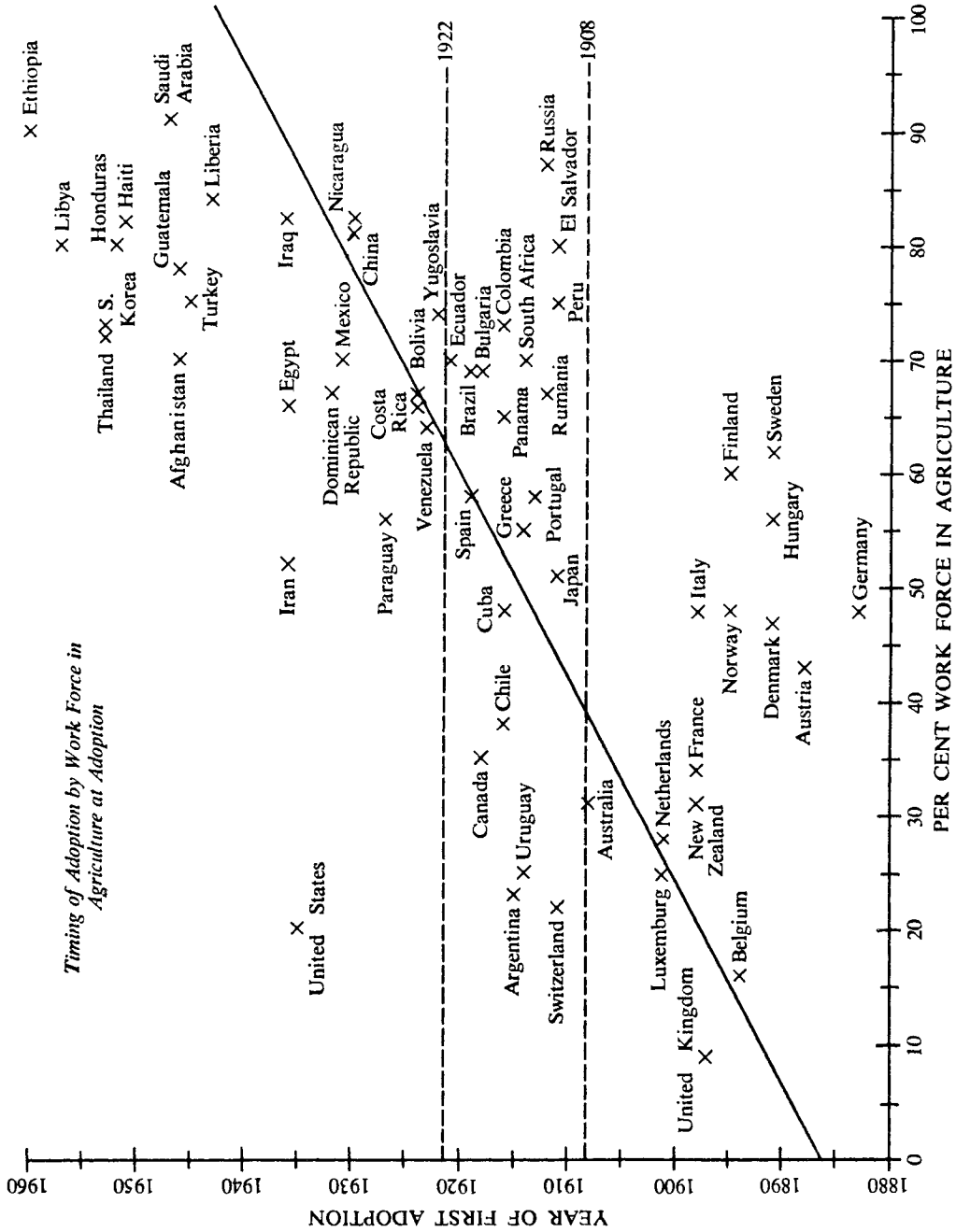


Figure 1

regard to the types of modern technology selected by developing countries.⁶¹

Aside from the question of the types of programs or technology that are selected, the pattern of social security adoption in Figure 1 may reflect a tendency toward a larger role of the state in society in later-developing countries. Dahrendorf and Gerschenkron have noted this tendency among European countries,⁶² and it may be present in broader frames of comparison as well. Though some developing countries have had considerable experience with mutual benefit associations and conventional insurance, the introduction of social security by the state appears to come far earlier relative to the development of these private arrangements among later adopters than it did in Europe.⁶³

The pattern of adoption may also be due in part to special characteristics of social security as a public policy. To the extent that it is financed by taxing employees who are covered by the programs, it has the unusual feature of being an easy form of taxation, since citizens may feel that they are not really paying taxes when they make social security payments, but rather that they are purchasing insurance. In addition, there is often an interval of many years between the payment of social security taxes and the retirement or illness for which the contributor is covered. Social security is therefore an easy form of taxation which produces large amounts of capital that are invested at the discretion of the social security administration. In some countries, this capital is loaned to the national government at low interest rates, or is distributed on a patronage basis to finance a variety of private or public projects.⁶⁴ It is easy to see that a government in a developing

country might be tempted to adopt social security even if the social and economic need for a program was more limited than it was at the time of adoption among the earliest adopters.

Another feature of social security that may account for this pattern of adoption is its tendency to weaken labor movements.⁶⁵ The use of social security in this co-optive way at earlier stages of development may be explained in part by the tendency for labor movements to appear at earlier stages of modernization in later developing countries.

Diffusion among the Earliest Adopters

In addition to the overall pattern of adoption reflected in Figure 1, three sub-patterns merit close attention. We will therefore present separate analyses of the earliest adopters, a middle group of adopters, and the later adopters.

Perhaps the most striking of these subpatterns is that among the earliest adopters. Within Europe, the first appearance of social security did not occur in the most advanced countries, but rather in 1883 in Germany, a later developer within the European context. The most advanced country—the United Kingdom—did not adopt until 1897. An examination of the lower part of Figure 1 reveals that though three countries did adopt at lower levels of modernization than Germany, there is a moderate but consistent tendency among the nations which adopted up until 1901 to do so at successively *higher* levels of modernization. The correlation for this group of countries is $-.49$, with the negative sign reflecting the tendency toward adoption by successively more advanced countries. It might be objected that this statistical finding depends largely on the fact that Germany was the first adopter and the United Kingdom was a later adopter for reasons perhaps unrelated to their level of modernization at adoption. However, the removal of these two countries leaves the correlation virtually unchanged. Similar patterns appear in the correla-

⁶¹ Harry Johnson, ed., *Economic Nationalism in Old and New States* (Chicago: University of Chicago Press, 1967), pp. 1ff.

⁶² See Alexander Gerschenkron, "Economic Backwardness in Historical Perspective," in *The Progress of the Underdeveloped Countries*, ed. Bert F. Hoselitz (Chicago: University of Chicago Press, 1952), pp. 3-29 and Ralf Dahrendorf, *Society and Democracy in Germany* (Garden City: Doubleday and Co., 1967).

⁶³ On the basis of data made available to the senior author by the Ministry of Labor in Peru, the earliest date of foundation of the mutual benefit associations which have received government recognition in that country is around 1900, only a few years before the first adoption of social security. Although there may have been other associations which were founded much earlier, this suggests at least tentatively that these associations had a far more limited development prior to the appearance of social security than in Europe.

⁶⁴ Robert J. Lampman, "The Investment of Social Security Reserves and Development Problems: The Philippines as a Case History," in *The Role of Social Security in Economic Development*, ed. Kassalow, pp. 92-93.

⁶⁵ The importance of social security in weakening labor movements has been suggested in Gaston V. Rimlinger, "Social Security and Industrialization: The Western Experience, with Possible Lessons for the Less Developed Nations," in Kassalow, *The Role of Social Security in Economic Development*, pp. 135 and 143 and in David Chaplin, *The Peruvian Industrial Labor Force* (Princeton: Princeton University Press, 1967), p. 78. The remarkable history of resistance to the adoption of national unemployment insurance in the United States by the American Federation of Labor also illustrates the importance of the threat posed to labor movements by social security. See Grant McConnell, *Private Power and American Democracy* (New York: Alfred A. Knopf, 1966), p. 85.

tions for the other measures of modernization.⁶⁶

Within this earlier group of adopters, there is thus a moderate tendency toward diffusion *up* a hierarchy, a type of diffusion that has received scant attention in diffusion research.⁶⁷ Yet if diffusion research is to avoid treating modernization as involving only innovations that emanate from the most advanced centers to the rest of the world, patterns of diffusion such as this must be given close attention.

How can this pattern of diffusion be explained? Rimlinger has argued that a principal variable affecting the timing of adoption of social security among early adopters was the extent of resistance to welfare programs due to the development of liberal ideology that stressed the importance of self-reliance on the part of the poor.⁶⁸ If one chooses to emphasize power relationships rather than ideology, a parallel argument can be made in terms of the extent to which industrialization was led by a capitalist entrepreneurial class which opposed state intervention in welfare, as opposed to an entrepreneurial state eager to win the political loyalty of the working class. The weaker development of liberalism and capitalism in countries such as Germany, Austria, and Hungary meant that there was less resistance to overcome, and that adoption came earlier in these nations. In terms of the idea of the co-optive use of social security referred to earlier, it may be argued—particularly with reference to Germany—that there was less resistance to using social security to secure the loyalty of the working class.

Two major explanations might be suggested in interpreting these relationships. On the one hand it might be argued that because an independent bourgeoisie played a larger role in industrialization in the earlier industrializers of Europe, the strength of liberal ideology (and capitalist practice) was therefore greater in these countries.⁶⁹ Alternatively, it might be argued that such *pre-modern* characteristics as the strong tradition of

a centralized state and of state paternalism in Central and Eastern Europe caused both later economic growth and earlier adoption of social security. It is beyond the scope of this research to test these alternative explanations. The crucial point is that regardless of which is correct, they both provide a rationale for the inverse relationship between the timing of economic growth and the timing of social security adoption among these countries.

Diffusion in the Middle Group of Adopters

Turning now to the cases of adoption in 1908 or later (there were no adoptions between 1901 and 1908), it can be seen in the upper part of Figure 1 that the general tendency toward adoption at lower levels of modernization among later adopters is present among these countries, though the correlation is somewhat weaker (.49) than among all 59 countries. A careful examination of Figure 1 suggests a partial explanation: instead of a consistent pattern of adoption by successively less modern nations, one finds that during the fifteen years after 1908, social security was adopted nearly simultaneously in highly advanced and relatively backward countries, and was then gradually adopted by successively less modern countries over the following several decades.

In the period from 1908 to 1922, the dominant pattern is not one of diffusion either up or down a hierarchy. The pattern appears instead to be one of spatial diffusion. Figure 2 provides a preliminary test of this hypothesis by illustrating the spatial distribution of adoption broken down into four time periods: 1883 to 1891; 1892 to 1901; 1908 to 1922; and 1923 and later.⁷⁰ The cases of adoption in 1901 and earlier are subdivided in order to illustrate more clearly the pattern of spatial diffusion within Europe. In examining this map, one should remember from the earlier discussion that while spatial diffusion may operate along simple lines of proximity, the relevant dimension of closeness may involve not only physical proximity, but proximity along dominant lines of communication.

Figure 2 shows that in addition to involving diffusion up a hierarchy, the pattern of adoption in Europe up to 1901 was also spatially ordered. The earlier adopters in this period were closer to the center of innovation—Germany—and the later adopters within this time period were in Western Europe. This spatial ordering is consistent with the earlier findings, and probably emerged because the timing of economic growth

⁶⁶ The correlations for work force in industry and real income for these countries are .34 and .22 respectively, with slight increases if Germany and the United Kingdom are removed.

⁶⁷ A close analogue to this pattern of diffusion may be found in social psychological discussions of marginal individuals as innovators. See Everett M. Rogers, *Diffusion of Innovations* (New York: The Free Press, 1962), chapter 7. In "The Diffusion of Innovations . . .," p. 883, Walker notes that Mississippi was the first state in the United States to adopt a general sales tax. This is not surprising, in light of the fact that this is a regressive tax. However, Walker does not report the pattern of adoption for this innovation following its introduction in Mississippi.

⁶⁸ Rimlinger, *Welfare Policy and Industrialization*, pp. 35ff and 93–98.

⁶⁹ See the Gerschenkron and Dahrendorf references cited in footnote 62 above.

⁷⁰ Berry and Neils, "Location, Size, and Shape of Cities as Influenced by Environmental Factors," p. 298, have used a somewhat similar mapping procedure to illustrate the spatial diffusion of street cars in the United States.

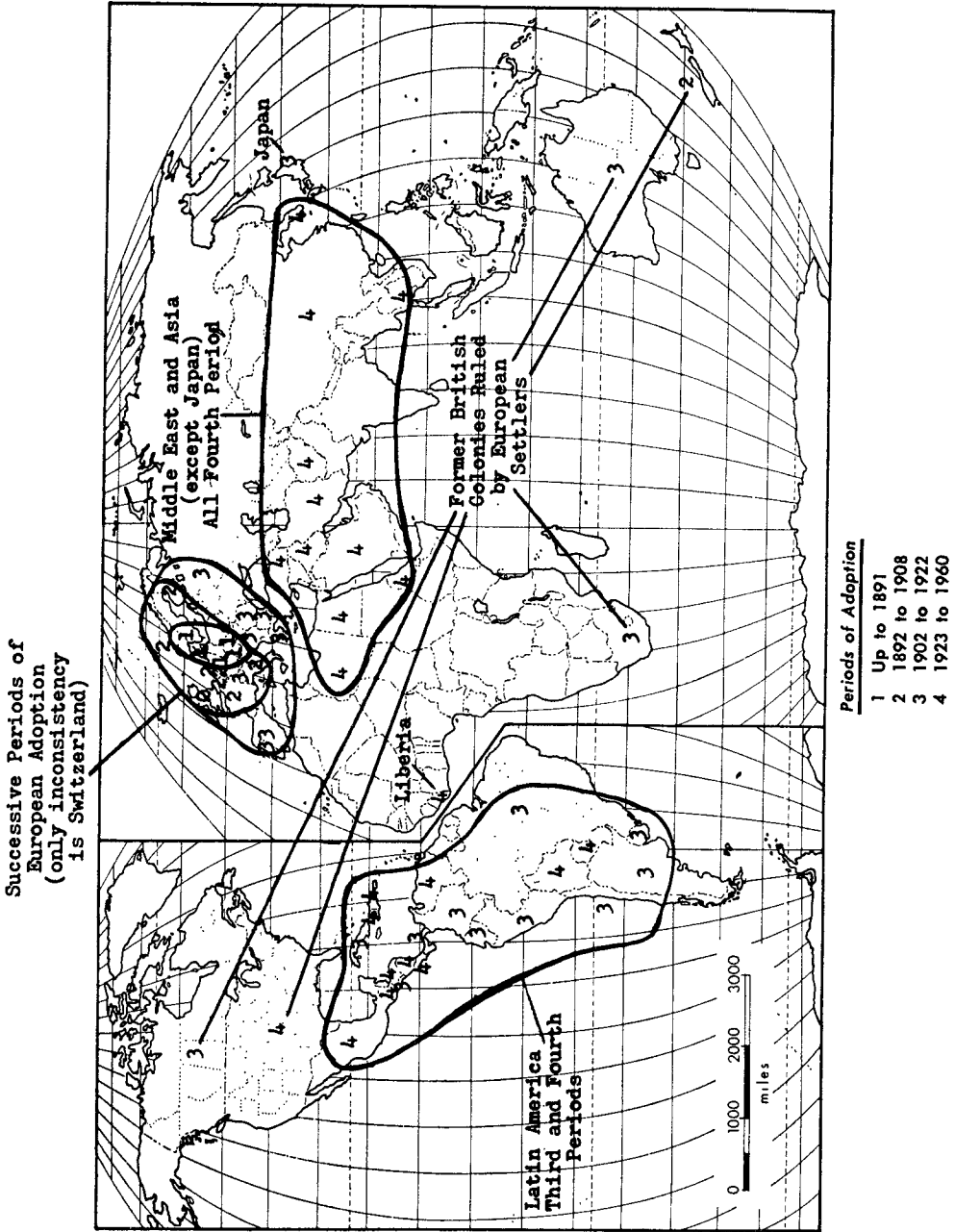


Figure 2. Timing and Spatial Distribution of Adoption

and the distribution of liberalism that emerged more strongly among the early modernizers also followed a regular spatial pattern.

An understanding of the pattern of adoption for the period 1908 to 1922 requires an examination of both the levels of modernization at adoption and the spatial distribution of adoption. It can be seen in Figure 1 that several of the countries that adopted in this period did so at relatively high levels of modernization—following a pattern that might be considered to be a continuation of the pattern of adoption among successively more advanced countries from the earlier period. This included not only an additional European country—Switzerland—but also two former British Colonies—Canada and Australia—and the most advanced Latin American countries—Argentina, Chile, and Uruguay.

The surprising feature of this period is that a number of much less modern countries adopted at almost exactly the same time. These adoptions may be due to a regional effect. They included *all* of the remaining countries in Europe—Greece, Spain, Portugal, Rumania, Bulgaria, Yugoslavia, and Russia. These countries apparently adopted in part because of their proximity to the earlier European adopters, even though some of them were at extremely low levels of modernization at adoption. A similar regional effect is present in Latin America, where countries adopted during this period at a wide range of levels of modernization during a relatively small number of years, with no clear hierarchical ordering of adoption. The remaining adopters during this period were an additional former British colony ruled by European settlers—South Africa—and Japan, the most advanced country of Asia.

Diffusion among the Late Adopters

The remaining countries to be considered are those which adopted social security after 1922. These include all of the countries of the Middle East and Asia except Japan; the remaining countries of Latin America; and Liberia and the United States. The late adoption in the United States may be interpreted as an extreme case of the impact of liberal ideology (or capitalist practice) that was discussed earlier. For the rest of the countries, regional effects are obviously present in the sense that particular regions of the world are involved. An examination of the upper right-hand corner of Figure 1 suggests, however, that the underlying effect may again be diffusion, this time *down* a hierarchy of modernization. If work force in agriculture is used as a measure of modernization, the correlation between level of modernization at adoption and timing of adoption is .49 among these countries. For work force in industry and real income, it is $-.55$ and $-.40$,

respectively.⁷¹ It is noteworthy that the size of these correlations has been reduced by two extreme outliers—the United States and, for the correlation with income, Libya—for which ambiguities about the appropriate scoring were resolved in a way that tended to weaken the confirmation of the hypothesis. If the opposite decisions had been made, these correlations would have been considerably higher.⁷²

Regardless of which correlations one accepts, a clear pattern of diffusion down a hierarchy of modernization is present. It should be emphasized, however, that this apparent diffusion pattern does not preclude the possibility of a prerequisites effect. One interpretation of the timing of adoption for most of the ten countries in the upper right hand corner of Figure 1 is that in terms of the pattern of hierarchical diffusion, social security finally diffused down to them. On the other hand, most of them experienced some degree of modernization in the decades preceding their adoption, and it might alternatively be argued that there is, indeed, a minimum level below which it is unlikely for adoption to occur, and that their adoption was delayed until they reached that level. The fact that adoption has not occurred in any country with more than 91 per cent of its work force in agriculture would appear to give some support to this conclusion.

Conclusion

This research has sought to analyze the patterns of social security adoption among nations. An examination of the overall pattern of adoption provided substantial support for the hypothesis that hierarchical diffusion is present, with later adopters tending to adopt at far lower levels of modernization than the early adopters. This relationship was interpreted as being in part an aspect of the tendency toward a larger role of the state in later-developing countries, and in part due to

⁷¹ These correlations are significant at the .01, .01, and .20 levels respectively. The correlations presented in the following paragraph are all significant at the .01 level.

⁷² The first involves ambiguity with regard to the year of adoption by the United States, which might be scored around 1920 because of the extensive development of work injury programs at the state level by that date (see Appendix). Though the date that was used for the United States does not make much difference in the correlations presented earlier, it places the United States in the group of late adopters and has a considerable effect on the correlations within this group. The other outlier is Libya in the correlation involving real income. Libya adopted at a far higher level of income than would be expected because it was already a major exporter of oil at the time of adoption. It might be argued that real income is a particularly misleading indicator of development for Libya.

certain characteristics of social security as a policy.

Within this overall pattern, three striking sub-patterns clearly emerged. Among the earliest adopters, social security actually diffuses *up* a hierarchy of nations rather than *down* a hierarchy. In the middle group of adopters, a pattern of spatial diffusion is present in which social security is rapidly diffused among countries at widely differing levels of modernization. Finally, a combination of hierarchical diffusion and a prerequisites explanation appear to be the most satisfactory means of accounting for the pattern of adoption among the latest adopters.

Apart from contributing to an understanding of the patterns of social security development, it is hoped that this research may help to suggest two innovations that might play a useful role in comparative political research. First, it is clearly time that comparative political analysis devoted more attention to the role of diffusion in political change. Though a few studies have considered it, most comparative research devotes no attention to it at all, thereby neglecting an important explanatory factor and running the risk of reaching misleading conclusions regarding the importance of causal factors that exist within each unit of analysis, due to Galton's problem. A useful starting point in an attempt to give more attention to diffusion might be to identify types of research that lend themselves to a diffusion perspective. The increasing concern in recent literature with the timing of modernization and with the rate, timing, and sequence of different aspects of modernization was referred to earlier. This would appear to be one of the areas of hypotheses in which explicit attention to diffusion might yield particularly interesting results.

With regard to alternative patterns of diffusion, it has been shown that one of the most interesting phases of the diffusion of social security was one in which it tended to be adopted by progressively more advanced countries, involving a pattern of diffusion up a hierarchy. It is obvious that a great many of the modernizing changes considered in studies of development do diffuse from more advanced centers to more backward regions. Yet, particularly in the area of political innovations, some of the most interesting new aspects of development originate not at the top of a developmental hierarchy, but part way down it. This is obviously the case for the Chinese and Cuban models of economic and political development, and must surely be the case for many other political innovations as well. Students of innovation would do well to seek out these alternative patterns of diffusion along with the more conventional types of diffusion from the most advanced to the less advanced centers.

APPENDIX

Deciding upon and collecting data for a meaningful statistical universe is a perennial problem of cross-national research. The universe studied in the present research consists of all nations listed in *Social Security Programs Throughout the World, 1971* which were autonomous with regard to domestic policy and were not socialist at the time of adoption.⁷³ Since a test of the prerequisites hypothesis would be less meaningful to the extent that adoption is imposed (as opposed to simply diffused) from outside, autonomy was required. On this basis, 65 countries were excluded which presently have social security but which were not autonomous with regard to domestic policy at the time of adoption, thereby eliminating all of Black Africa except Liberia and a number of countries in Asia and the Middle East. This criterion permitted the inclusion of certain countries—Hungary, Finland, and some Commonwealth nations—which were not formally independent at adoption, but which were autonomous with regard to domestic policy.

Countries which were socialist at the time of adoption were excluded because social security involves very different issues in socialist countries than in capitalist countries and including socialist countries might distort the analysis.⁷⁴ In practice, only one country proved to have been socialist at the time of adoption—Albania. It was therefore excluded from the analysis. With the exclusion of the dependent units and Albania, 59 countries remain in the universe of analysis.

The four principal variables used in the analysis are the year of the first adoption of social security, the percentage of the work force in agriculture, the percentage of the work force in industry, and real income per capita in the year of adoption. Since these variables cover three-quarters of a century, the problems of finding adequate data are obviously serious. Fortunately, however, the earlier adopters tend to be those countries for which more complete historical data are available, so that it was possible to find complete data on work force in agriculture and industry for all countries except China and Luxembourg. The data were far less complete for real income, with information having been available for only 36 of the 59 countries.

⁷³ United States Department of Health, Education, and Welfare, *Social Security Programs Throughout the World, 1971*. The only nations not reporting to the Social Security Administration were Guinea, Fiji, Kuwait, Lesotho, Maldive Islands, Nepal, North Korea, and Southern Yemen.

⁷⁴ This point is made by Vladmir Rys, "Some Current Problems of Social Security in the World," *Bulletin of the International Social Security Association*, 21 (1968), 432-442, at p. 439.

The source for the year of first adoption is *Social Security Programs Throughout the World, 1971*. The definition of social security used in this source for determining first adoption is paraphrased in the discussion of the development of social security in the text. Exhaustive historical research on social security development in the 59 countries considered here would doubtless raise questions about the appropriate identification of the first law in a few cases which could result in small changes in the date of first adoption. It is clear, however, that these changes would generally be so small as to have virtually no effect on the findings reported in this research.

A problem of validity may arise in connection with adoption in federal systems, however. For example, although it was not until 1936 that national social security legislation was passed in the United States, 45 states had some form of work-injury insurance by 1920. While the authors chose to use the 1936 date, it should be noted that some of the relationships presented in the research would be stronger if the 1920 date had been used. An exhaustive investigation of legislation in sub-national units in other countries with federal systems might raise similar questions about their year of first adoption.

In estimating the values for the three indicators of level of development at the time of adoption, we were fortunate to be able to rely on the work of two economists, Colin Clark and Simon Kuznets.⁷⁵ Though Clark and Kuznets rarely provided data for the exact year of adoption, they generally provided data at ten-year intervals, so that linear interpolation between their dates generally provided fairly reliable estimates. If Clark and Kuznets differed, we relied on Kuznets, since his work is more recent and in many cases involved an updating of Clark. When the three Kuznets publications differed, the more recent

one was again chosen. A smaller number of the estimates were based on the unpublished 1971 version of Arthur S. Banks's Cross-National Time-Series Data Archive, which was kindly supplied by Professor Banks. In a few cases in which the time series in the Banks data fell short by a few years of the year of adoption, linear extrapolations were used. For certain countries, other sources were used, generally based on census data for a year close to the year of adoption.⁷⁶

Clark, Kuznets, and Banks define agriculture as including agriculture proper, fishing, forestry, trapping, and nomadic grazing. Though slight variations in the definition of industry exist even within the data presented by individual authors, it generally included not only industry itself, but also mining, construction, transportation, and communication. Because of the definition of industry used by these authors, the percentage in industry is higher than might be expected if one is accustomed to thinking in terms of strictly industrial activities. However, these other activities also lead to opportunities for worker organization and create for workers many of the same problems and needs as industrial employment. Hence, in terms of the concerns of the present analysis, the particular activities included in this definition do not pose a problem.

Real income per capita is gross national product per capita expressed in international units which correspond to the average value of dollars in the United States over the period 1925 to 1934. Most of the income data are from Clark, who includes in the definition of income the value of farm products which never enter the market and are consumed in farm households. When the data were obtained from a source other than Clark, they were converted so as to be roughly equivalent to 1930 dollars.

⁷⁵ Colin Clark, *The Conditions of Economic Progress* (London: Macmillan & Co., 1957); Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations II: Industrial Distribution of National Production and Labor Force," *Economic Development and Cultural Change*, supplement to Vol. V, No. 4 (July, 1957); Kuznets, *Modern Economic Growth: Rate Structure and Spread* (New Haven: Yale University Press, 1966); and Kuznets, *The Economic Growth of Nations* (Cambridge: Harvard University Press, 1971).

⁷⁶ Other sources include Stanley Braithwaite, "Real Income Levels in Latin America," *The Review of Income and Wealth*, Series 14, No. 2 (June, 1968), p. 146-47; Everett E. Hagan and Ali Hawrylyshin, "Analysis of World Income and Growth, 1955-1965," *Economic Development and Cultural Change*, Vol. IV, No. 1 (November, 1955); *Statesman's Yearbook*, various years; Irene B. Taeuber, *The Population of Japan* (Princeton, N.J.: Princeton University Press, 1958); and United Nations, *Demographic Yearbook*, various years.