The Economy and Suicide:

A Time-Series Study of the U.S.A.

By BIJOU YANG*

ABSTRACT. The *suicide rate* for the U.S.A. for the period of 1940–84 was posited to be the consequence of the interplay of economic and social variables. The single equation regression was applied to the suicide rates for the total population and for the four sex by race *social groups.* The results indicated that: (1) suicide rates did not increase during the *economic booms* and busts as predicted by *Durkheim,* and the change depended upon the social groups involved; (2) the *unemployment rate* had significant detrimental impact only on the white male suicide rate; (3) the female *labor force* participation rate had beneficial impact on both the white and non-white female suicide rates; (4) the *divorce* rate was the only variable that had a consistent impact for all social groups; and (5) membership in the *Catholic Church* had a positive association with the suicide rates.

I

Introduction

THREE SOCIOLOGICAL THEORIES illuminate the relationship between the economy and suicide. Durkheim (1897) believed that society constrains individuals in two ways: first, by attaching them to socially assigned purposes and ideals (integration) and second, by moderating their desires and aspirations (regulation) (Taylor, 1982, p. 13). Durkheim posited that, since economic prosperity and depression bring about less social integration and less social regulation than normal economic situations, the suicide rate rises accordingly. Ginsberg's (1966) theory postulated that suicide is procyclical: suicide rates drop during economic depressions and rise during economic expansions. The third type of relationship proposed between the economy and the suicide rate is that suicide is countercyclical. During booms, fewer suicides occur, while during recessions more suicides occur (Ogburn and Thomas, 1922; Thomas, 1927; Dublin and Bunzel, 1933; Henry and Short, 1954). Among these theories, Henry and Short's is the best articulated and, therefore, it will be cited as the representative of the group.

Some recent empirical studies of the relationship between the economy and suicide have focused on the negative impact of the economy on suicide through unemployment (*e.g.,* Eyer, 1977; Kreitman and Platt, 1984; Boor, 1980), *i.e.,*

* [Bijou Yang, Ph.D., is assistant professor of economics, College of Business and Administration, Drexel University, Philadelphia, PA 19104.]

American Journal of Economics and Sociology, Vol. 51, No. 1 (January, 1992).

the greater the unemployment rate, the higher the suicide rate.[1] Some studies have included other economic variables in order to capture the positive impact of the economy on suicide (*e.g.,* Brenner, 1979, 1983),[2] while other studies have combined the unemployment rate with other social variables in order to explain the suicide rate (*e.g.,* Vidgerhous and Fishman, 1978; Stack, 1987).

This paper hypothesized that the determination of the suicide rate of a society is the result of an interplay between economic and social variables. Moreover both the positive and the negative impacts of the economy on suicide are combined in the model. The next two sections introduce the model and data and method respectively. There follow sections describing results, discussing the findings and summarizing the conclusions.

II

The Model

WE HYPOTHESIZE that the suicide rate of a society should be affected by a combination of a number of economic and social variables, namely, the per capita gross national product, the unemployment rate, the divorce rate, the proportion of the population which is Catholic, and the female labor force participation rate.[3]

Durkheim postulated that economic forces influence the societal rate of suicide to the extent that they weaken social integration and social regulation. The economic variables and institutions have an impact upon the suicide rate, not directly, but rather *indirectly* through their influence on social integration and social regulation. In contrast, we believe that economic forces can have their impact on the suicide rate of a society *directly.* This impact can be brought forth by both long-term and short-term economic variables.

For example, secular economic growth tends to be associated with technological breakthroughs, increases in knowledge, and improvements in social and economic systems (such as the entitlement programs, job training programs, financial regulations, etc.). The consequence is an upgrading of the standard of living, including a higher level of material well-being, increased public health facilities (for physical and mental health), improved education, etc. Moreover, continuing economic growth also implies a continued increase in occupational status and decreasing physical stress and job hazards (Brenner, 1977, p. 585). The per capita gross national product is used in the model to represent long-term economic advancement.

The consequences of economic growth are not always positive. Urbanization, for example, is not necessarily good. The degree of decline in social cohesion or the increase in social isolation due to urbanization is conceived as "both a structural cause of and an individual motivation for suicide" (Taylor, 1982, p.

26).[4] However, since annual data on urbanization are not available, we cannot include urbanization as one of the explanatory variables for the suicide rate.[5]

The unemployment rate is an indicator of the business cycle. Therefore, it is used to assess the impact of short-term cyclical economic movement on the suicide rate. The loss of a job leads to the loss of identity in the individual as a function of his or her work role, a severing of a fundamental link between the individual and his family to society (Brenner, 1977, p. 583), and a disruption of economic life for the individual and his family. All of these distresses originating from economic instability are a primary source of individual trauma which may trigger suicidal behavior.

We also believe that social institutions such as family, work, and religion also play an important role in reinforcing or weakening the social tie between individuals and the society. Divorce, according to Durkheim, leads to a lack of social control. The act of divorce breaks an institution which "regulates human wants, needs and sexual desires and relationships" (Vigderhous and Fishman, 1978, p. 246). The divorce rate is viewed, therefore, as another primary source of individual trauma that might precipitate suicidal behavior.

Catholicism was also believed by Durkheim to provide social cohesion in deterring people from committing suicide and to provide moral reasons for living. The proportion of the population which is Catholic is used in the model to explore whether this religious variable reduces the rate of suicide.[6]

Work has both economic and social effects on the individual. The beneficial economic effect from the employment opportunities provided by a sound and continually growing economy, and the detrimental economic effect from unemployment generated by the short-run business cycle have already been considered above. In addition, major structural changes in the labor force have occurred. One, an increasing participation of women in the labor force, needs to be incorporated into the model.

The impact of female participation in the labor force on the suicide rates is expected to work in two ways. On the one hand, women working creates role conflicts (Stack, 1978), which in turn decrease social integration. This, according to Gibbs and Martin (1964), leads to a higher suicide rate.[7] On the other hand, participation in the labor force provides opportunities for women to develop themselves more fully, which might help strengthen their social bonds and integration, leading to lower suicide rates. In fact, an application of Sieber's (1974) and Marks's (1977) role theories was cited by Stack (1987, p. 261) to support a similar idea. The working experience of women provides both economic and associated benefits for women through role accumulation or role expansion. The net impact on the suicide rate depends, therefore, upon the relative importance of these two effects.

A dummy variable is also included to take into account U.S. participation in World War II. Hardships encountered during the war can be always attributed to the external events. In addition, there may be an increase in social integration and social regulation through working and suffering together with family and others in the community for the same good cause during wartime. Participation in World War II is, therefore, expected to decrease the suicide rate of the U.S. The Korean War and Vietnam War were not considered because they were not major wars, and society's involvement was limited to specific cohorts of the population, consideration of which is beyond the scope of the present study.

Interstate migration which is motivated by either economic or social reasons is also considered an important factor that might have an impact on the suicide rate. Research has supported the hypothesis that interstate migration is associated with the overall suicide rate as well as the suicide rates for males and females at the state level (*e.g.,* Yang and Lester, 1988; Lester, 1988).[8] However, time series data for interstate migration are not available. We are, therefore, unable to include the interstate migration as an explanatory variable in our model.

Some investigators have suggested that economic variables should be lagged behind the suicide rates to allow for the fact that the impact of the economy on suicide might take more than one year to appear. But since the lagged value of unemployment proved to have no statistically significant impact on the suicide in the present analyses, only the lagged value of the per capita gross national product is used in the final analysis reported here. All the variables except the dummy variables and those measured as proportions are expressed in natural logarithms so that the regression coefficients are comparable.

III

Data and Method

DATA WERE COLLECTED for the period of 1940 to 1984. This sample period was chosen because of the constraint of data availability.[9] Table 1 shows the sources for each measure.[10] In addition, Table 2 shows the suicide rates during the period for the four demographic groups studied. It can be seen that the overall suicide rate of the U.S. during this period fluctuated within the range of 9.8 to 14.4 per 100,000 persons per year. The overall rate declined after 1940, reached bottom in 1957 and started to rise again thereafter. The suicide rate by sex and race (whites versus non-whites) in Table 2 indicate that (1) men seem to have higher suicide rates than women, and (2) whites appear to have higher suicide rates than non-whites.

Multiple regression analysis (Doan, 1988) was applied to the overall suicide rate, and also to the suicide rates for white males, white females, non-white

Table 1
SOURCES OF DATA

DESCRIPTION	PUBLICATION
Gross National Product (1982 constant dollars)	The Council of Economic Advisers, Economic Report of The President, 1970 and 1989
Population	Same, 1989
Unemployment rate, and Female labor force participation rate	1. For 1950-1984: The Council of Economic Advisers, Economic Report of The President, 1989 2. For 1940-1949: Department of Commerce, Bureau of Census, Historical Statistics of The USA
Divorce rate, and Roman Catholic church membership	1. For 1971-1984 Department of Commerce, Bureau of Census, Statistical Abstract of The USA, Various issues. 2. For 1940-1970 Department of Commerce, Bureau of Census, Historical Statistics of The USA

males, and non-white females so that we may explore the differences in the etiology of suicide rates among the four different social groups.[11]

IV

Results of Estimation

THE RESULTS of the multiple regression are shown in Table 3. The findings of the regression analyses are as follows:

(1) For the overall suicide rate, all of the independent variables were significant at the 5% level. The impact of economic growth on the overall suicide rate was as expected in the hypothesis as indicated by the sum of the coefficients associated with the current year and the one-year lagged per capita gross national product, that is $-.57 + .48 = -.11$.[12] This means that when the real income on a per capita basis increases by 1%, the suicide rate decreases by .11%.

Both the unemployment rate and the divorce rate also had a positive sign as expected. The divorce rate seemed to be the strongest variable in terms of its absolute impact on the overall suicide rate.

Table 2
SUICIDE RATES: OVERALL AND FOR EACH GROUP
(PER 100,000 PERSONS PER YEAR)

YEAR	OVERALL	WHITE MALE	WHITE FEMALE	NON-WHITE MALE	NON-WHITE FEMALE
1940	14.4	23.5	7.3	7.2	2.1
1941	12.8	20.8	6.8	6.6	1.7
1942	12.0	19.7	6.3	6.0	2.0
1943	10.2	16.4	5.9	4.8	1.3
1944	10.0	16.0	5.9	4.8	1.4
1945	11.2	18.5	6.3	5.7	1.5
1946	11.5	18.7	6.2	6.1	1.8
1947	11.5	18.9	6.0	6.5	1.6
1948	11.2	18.4	5.7	6.9	1.5
1949	11.4	19.1	5.5	7.1	1.5
1950	11.4	19.0	5.5	7.0	1.7
1951	10.4	17.3	5.0	6.6	1.7
1952	10.0	16.9	4.7	6.1	1.3
1953	10.1	17.2	4.6	6.4	1.3
1954	10.1	17.5	4.5	6.8	1.5
1955	10.2	17.2	4.9	6.1	1.5
1956	10.0	16.9	4.8	6.1	1.6
1957	9.8	16.5	4.6	6.8	1.4
1958	10.7	18.0	5.1	7.1	1.8
1959	10.6	17.7	5.0	7.5	1.9
1960	10.6	17.6	5.3	7.2	2.0
1961	10.4	17.1	5.3	7.6	1.9
1962	10.9	17.8	5.9	7.2	2.2
1963	11.0	17.8	6.3	7.9	2.2
1964	10.8	17.2	6.1	7.2	2.2
1965	11.1	17.4	6.6	7.7	2.5
1966	10.9	17.2	6.3	7.8	2.4
1967	10.8	16.8	6.5	7.6	2.7
1968	10.7	16.9	6.3	7.3	2.4
1969	11.1	17.2	6.8	8.1	2.8
1970	11.6	19.0	7.1	8.5	2.9
1971	11.7	17.9	7.3	8.6	3.4
1972	12.0	18.5	7.3	10.3	3.3
1973	12.0	18.8	7.0	10.0	3.0
1974	12.1	19.2	7.1	10.2	3.0
1975	12.7	20.1	7.4	10.6	3.3
1976	12.5	19.8	7.2	11.0	3.2
1977	13.3	21.4	7.3	11.4	3.5
1978	12.5	20.2	6.9	11.1	3.1
1979	12.1	19.6	6.5	12.0	3.1
1980	11.9	19.9	5.9	10.6	2.6
1981	12.0	20.0	6.2	10.6	2.9
1982	12.2	20.7	6.1	10.3	2.5
1983	12.1	20.6	5.9	10.8	2.5
1984	12.4	21.3	5.9	11.0	2.6

Source: Holinger, P. C. Violent Deaths in the United States, New York: Guilford, 1987.

Table 3
REGRESSION RESULTS FOR THE SUICIDE RATES OF THE USA FOR 1940-84

DEPENDENT VARIABLE[a]	INDEPENDENT VARIABLES						
	Const.	GNPPC	$GNPPC_{-1}$	UR	DUMMY	FLFP	DIV	CATH
Overall	1.57	.48*	-.57*	.01*	-.06*	-.01*	.35*	.01*
suicide	(1.65)	(4.18)	(6.34)	(4.14)	(2.30)	(3.16)	(10.35)	(3.00)
rate		R^2 = .92		$RBAR^2$ = .90		F = 31.9		DW = 2.02
White	3.43*	.19	-.36*	.02*	-.10*	.00	.21*	-.00
male	(3.46)	(1.55)	(3.83)	(4.33)	(4.03)	(.31)	(5.96)	(1.09)
rate		R^2 = .91		$RBAR^2$ = .88		F = 33.2		DW = 2.19
White	-4.58	1.35*	-.99*	.01	.12*	-.05*	.73*	.06*
female	(1.98)	(4.77)	(4.49)	(1.65)	(2.09)	(5.71)	(8.76)	(5.49)
rate		R^2 = .85		$RBAR^2$ = .82		F = 78.8		DW = 1.65
Non-white	4.32	.08	-.76*	.01	-.24*	.02*	.45*	.04*
male	(1.91)	(.29)	(3.85)	(1.17)	(4.29)	(2.56)	(5.63)	(4.31)
rate		R^2 = .95		$RBAR^2$ = .94		F = 75.8		DW = 1.41
Non-white	-8.52*	1.80*	-1.33*	.02	-.09	-.04*	.89*	.11*
female	(2.58)	(4.51)	(4.29)	(1.71)	(1.09)	(3.86)	(7.58)	(7.18)
rate		R^2 = .94		$RBAR^2$ = .92		F = 110.8		DW = 2.29

KEY: INDEPENDENT VARIABLES[a,b,c]
Const. : constant term GNPPC : per capita gross national product
$GNPPC_{-1}$: a one-year lagged value of GNPPC UR : unemployment rate
DUMMY : a dummy variable variable: 1 for 1942 to 1945; 0, otherwise
FLFP : female labor force participation rate DIV: divorce rate
CATH : proportion of Catholic population

a All the dependent and independent variables except UR, DUMMY, FLFP, and CATH were in natural logarithm form.

b Number inside the parenthesis indicates the t-statistic (value) of the coefficient. It is calculated as the ratio of the estimated parameter value to its standard error and is a means of determining the statistical significance of the variable hypothesized in an econometric model.

c $RBAR^2$ is the R^2 adjusted for the degrees of freedom, and F value is calculated to show the significance of R^2s.

* Significant at 5% level; otherwise, non-significant. The critical t-value for 5% level of significance is around 2.03 (Doti and Adibi, 1988, p. 466).

The sign for the dummy variable of the war participation was negative as expected. This seems sensible, considering that any hardship encountered in life during the war can be always attributed to the external environment and on the basis of the presumed increase in social integration and social regulation during wartime.

Female labor force participation rate has increased steadily from 28% in 1940 to 54% in 1984. When other economic and sociological variables were taken into account, the regression result indicated that as more females participated in the labor force the overall suicide rate decreased.

It is interesting to note that the percentage of the Catholic population had a positive coefficient in the regression for the overall suicide rate, opposite to the prediction. According to Durkheim, "The greater the concessions a confessional group makes to individual judgment, the less it dominates lives, and the less its cohesion and vitality."[13] The positive coefficient suggests that the Catholicism may have evolved to become more tolerant of individual judgment. Furthermore, American Catholics might have been always more individualistic than those in other societies. Without further research and investigation we may take this result to imply only that, when other economic and sociological variables are taken into account, the regulating force of U.S. Catholicism may not be as powerful as sociologists expect it to be.

(2) For the white male suicide rate, the regression coefficients were non-significant for the current year of per capita gross national product, the female labor force participation rate, and the proportion of the Catholic population. For the other variables, the sign of the coefficients followed the hypothesized pattern. However, it should be noted that, for white males, the previous year's general economic condition had the greatest impact on their suicide rates. This may imply that the beneficial impacts of economic advancement on the white male suicide rate take one year to be effective.

(3) For the white female suicide rate, the unemployment rate did not have a significant impact, while the wartime period had a significant detrimental impact. Perhaps white females were the most devastated among the four social groups by wartime casualties, since the majority of young soldiers were white.

For the other variables, their impacts on the white female suicide rate seemed to be stronger than for the other social groups in terms of the absolute order of magnitude of the regression coefficients. It should be also noted that economic growth showed a net "positive" (in sign) impact on the white female suicide rate, which means that the white female suicide rate increased along with higher levels of the per capita gross national product. This may imply that the detrimental impact of economic advancement somehow offset its beneficial impact on the suicide rate of white females.

(4) For the non-white male suicide rate, as in the case of the white male suicide rate, the current year of per capital gross national product did not have a significant contribution. Noteworthy was that, as the female labor force participation rate increased, the non-white male suicide rate rose as well. This implies that the non-white males felt more role strain from the female labor force participation than their white counterparts.

(5) The non-white female suicide rate shared three things in common with white female suicide rate: (i) the unemployment rate did not show significant effects, (ii) economic growth had a net "positive" (in sign) impact on the suicide rate of this group, and (iii) the female labor force participation rate appeared to be associated with a lower suicide rate in this group, possibly through benefits such as role accumulation or role expansion.

The R^2s and adjusted R^2s ($RBAR^2$) for all the regressions of concern were greater than .80. These regression equations were highly significant ($p < 0.01$) using F-tests.[14] The estimated equations for the overall suicide rate, the white male suicide rate, and the non-white female suicide rate seemed to show no significant positive autocorrelation since their Durbin-Watson (DW) values were above the upper boundary of the critical value, while the DW values for the other two regressions fell into the indeterminate range.[15] Even though the explanatory variables of concern were associated with one another (for example, GNPPC and UR; DIV and FLFP), we did not have to worry about the problem of multicollinearity. For one thing, the denomination of all the variables except unemployment rate, FLFP, and CATH was in natural logarithm (and therefore non-linear). Second, the theoretical relationship between these explanatory variables, if it existed, was more likely to be non-linear than to be linear.[16]

V

Discussion

THIS STUDY has attempted to combine economic and sociological variables in order to account for the variation of suicide rates over time of different social groups in the U.S.A. for the period of 1940 to 1984. To the extent that the net impact of economic growth on the overall suicide rate was "negative" in sign, this means that, as the economy continued to grow, the overall suicide rate tended to decrease. This is basically consistent with the theory of Henry and Short. However, for the female suicide rate, regardless of race, the result was opposite. The female suicide rate for both whites and non-whites increased during economic growth. This was predicted by Ginsberg's theory.[17]

The opposite association of female suicide rates to economic growth from that of the male suicide rates indicated a strong gender difference in the suicidal behaviors of this society. The other gender difference was in the impact of the female labor force participation rate. When the female labor force participation rate increased, the male suicide rates either increased or were not affected, whereas the female suicide rates dropped.

The divorce rate is the only variable that had a consistent impact on the suicide rates of all social groups. This finding is consistent with other research documented in the literature. However, a substantial gender difference also existed

in the impact of divorce on suicide rates, with divorce playing a stronger role for the female suicide rate. Assuming we can generalize from ecological findings to individuals, this seems to imply that the mental health of women may be more vulnerable to the traumatic experience of divorce than is the mental health of men. This may be due to the different economic situations and prospects of males and females after divorce.

The unemployment rate, as mentioned above, has been cited as having an important economic impact on suicide rates in numerous studies over the years (Platt, 1984). Its contribution to the explanation of suicide rates in the presence of other economic and sociological variables as specified in the present study was quite modest. In fact, the results of the regression analyses showed that among the four social groups the explanatory power of unemployment was significant only for white males.

While a gender difference can be detected in three variables as described above, a racial difference was not so clear. The only difference was in the male suicide rates. As the female labor force participation rate increased, the non-white male suicide rate increased, while the white male suicide rate was not affected.

VI

Conclusions

THIS RESEARCH has presented an economic-sociological approach to the study of the suicide rates of the U.S.A. for the period of 1940 to 1984. The economic variables (the current year and a one-year lagged of per capita gross national product, and the unemployment rate) and sociological variables (the divorce rate, the female labor force participation rate, and the proportion of the Catholic population) plus the participation of World War II were statistically significant in accounting for the overall suicide rates of the U.S.A. The disaggregate examination of the suicide rates of the four social groups, namely, white males, white females, non-white males, and non-white females indicated the following features:

(1) Economic growth seemed to have a beneficial impact on male suicide rates, yet a detrimental impact on females. This means that the suicide rates did not increase during the economic booms and busts as predicted by Durkheim. The impact depended on the social group involved.

(2) The female labor force participation rate appeared to have a beneficial impact on both the white and non-white female suicide rates, but the unemployment rate had a statistically significant impact only on the white male suicide rate. However, with the effects of the other economic and sociological variables

held constant, both female labor force participation rate and the unemployment rate had a rather modest impact on the suicide rate.

(3) The divorce rate seemed to have the strongest and most consistent impact.

(4) The regression results indicated that the impact of Catholicism on the suicide rate was opposite to that predicted by sociologists. While the explanation for this is not obvious and needs further investigation, it may be taken to imply that, with the presence of powerful economic and sociological variables in the model of suicide, the regulating force of religion might be quite small, at least in the U.S.

Further research especially on the individual level is needed to explain: (1) the gender difference in these regression equations, and (2) the puzzling impact of Catholicism. In addition, it would be of interest to apply the present economic-sociological model to cross-sectional data to see if similar results would be obtained for the variation in regional suicide rates. Lastly, given the complexity of the suicide problem, a better alternative approach to the suicide rate for the society as a whole might be a simultaneous equation system rather than a single equation.

Notes

1. For a detailed literature review on the subject see Platt (1984).

2. Brenner used the exponential trend of real per capita income (1983), or the economic growth trend and welfare expenditure (1979) to capture the positive impact of the society on suicide.

3. The growth rate of GNP was originally used but proved to be not statistically significant. The unemployment rate, therefore, serves as an indicator of cyclical economic movement.

4. According to Taylor, Halbwachs (1930) attributed the high suicide rate in urban areas as compared to rural areas to the greater degree of social isolation in cities. For a detailed account of suicide and social isolation, see also Stengel (1964).

5. We attempted to use the proportion of the population in urban areas to indicate the degree of urbanization in this country. Unfortunately the *Historical Statistics of the United States* published by the Bureau of Census, Department of Commerce does not include annual data for this.

6. The proportion of Catholic population was used because of its availability for the sample period and because previous investigators have occasionally included it in their correlational analyses.

7. Tests of the association between higher female participation in the labor force and the suicide rate are not conclusive. For example, Newman, *et al.* (1973) found a positive association between participation of females in the labor force and the overall suicide rate over census tracts in both Atlanta and Chicago. Davis (1981) reported a similar positive association for the female suicide rate, but not for the male suicide rate. However, Lester (1973) and Diggory and Lester (1976) failed to find any association in Buffalo for either the male or female suicide rate.

8. Among the 27 variables considered for Lester's (1988) correlational study for the suicide rate, divorce and interstate migration turned out to have the highest correlation with suicide.

9. For example, for both the unemployment rate and female labor force participation, the time series data go back only as far as 1940 as indicated in *Historical Statistics of the U.S.A.* published by the Bureau of Census, Department of Commerce.

10. The per capita gross national product was calculated by dividing the constant value of gross national product at 1982 prices by the population. The proportion of the Catholic population was obtained by dividing the number of Roman Catholics by the population.

11. The multiple regression was chosen for this paper is a matter of preference on the author's part. The author does recognize the other plausible and viable statistical tools such as path analysis. Path analysis is popular among sociologists (*e.g.,* Eatwell, *et al.,* 1990). In addition, a general equilibrium framework, if ever formulated, would suggest the use of econometric approach (simultaneous equation system).

12. When other variables are held constant, the variable of concern, GNPPC, is allowed to change to show its partial impact on the suicide rate. This impact may take two years to appear. The two beta coefficients for the unlagged and the lagged variables) can be added because they relate to the same variable, which is per capita gross national product (GNPPC).

13. See Durkheim, Emile: *Suicide,* Translated by J. A. Spaulding and G. Simpson, New York: Free Press, 1951, p. 159.

14. The critical F value at the 1% level of significance with 1 and 36 as the two relevant degrees of freedom is between 7.31 and 7.56 (see Doti and Adibi, 1988, p. 467). A range rather than a single F value is given here because the reference does not cover an F-distribution table as detailed as needed for the specification of this paper.

15. The critical value for the Durbin-Watson (DW) test (with 45 observations and 7 independent variables) at 5% level has a lower boundary of 1.189 and an upper boundary of 1.895 (see Judge, *et al.,* 1988, p. 992).

16. Some of the procedures suggested for solving the multicollinearity problem often do more harm than good (such as dropping the variable containing specific information). Others are called "ad hoc procedures" (such as ridge regression). For a detailed discussion, see, for example, Maddala (1988), chapter 7.

17. As far as the relationship between economic variables and the suicide rate is concerned, the historical experience of the U.S. does not support the conclusions of Durkheim. The economic growth of the U.S. was strongest in the 1950s and 1960s, but the overall suicide rate in the same period was low. However, Durkheim's concepts of social integration and social isolation were useful in illuminating how divorce may play a role in the determination of suicide.

References

Boor, M., "Relationships Between Unemployment Rates and Suicide Rates in Eight Countries, 1962–1976," *Psychological Reports* (1980) 47, 1095–1101.

Brenner, M. H., "Mortality and The National Economy," *Lancet* 15 Sept (1979): 568–573.

Brenner, M. H., "Mortality and Economic Instability: Detailed Analyses for Britain and Comparative Analyses for Selected Industrialized Countries." *International Journal of Health Services* 13(1983): 563–620.

Davis, R., "Female Labor Force Participation, Status Integration and Suicide, 1950–1969," *Suicide & Life-Threatening Behavior* 11(1981): 111–123.

Diggory, J. C. and D. Lester, "Suicide Rates of Men and Women," *Omega* 7(1976): 95–101.

Doan, T. A., *Regression Analysis of Time Series* Version 3.00 (Evanston, IL: Var Econometreics, 1988).

Dodi, J. L. and E. Adibi, *Econometric Analysis: An Applications Approach.* (Englewood Cliffs, NJ: Prentice Hall, 1988).

Dublin, L. I. and B. Bunzel, *To Be Or Not To Be* (New York: Smith and Haas, 1933).

Durkheim, E., *Le suicide* (Paris: Felix Alcan, 1897).

Durkheim, E., *Suicide.* Translated by J. A. Spaulding and G. Simpson (New York: Free Press, 1951).

Eatwell, J., M. Milgate, and P. Newman. (eds.) *The New Palgrave:* "Econometrics." by M. Hashem Pesaran, (New York: Norton, 1990).

Eyer, J., "Does Unemployment Cause the Death Rate Peak in Each Business Cycle? A Multifactor Model of Death Rate Change." *International Journal of Health Services* 7(1977): 625–662.

Gibbs, J. D. and W. T. Martin, *Status Integration And Suicide.* Eugene: University of Oregon, 1964.

Ginsberg, R. B., "Anomie and Aspirations." *Dissertation Abstracts* 27A(1966): 3945–3946.

Halbwachs, M., *Les Causes Du Suicide* (Paris: Alcan, 1930).

Henry, A. F. and J. F. Short, *Suicide and Homicide* (New York: Free Press, 1954).

Judge, G. G., R. C. Hill, W. E. Griffiths, H. Lutkepohl, and T.-C. Lee, *Introduction to the Theory and Practice of Econometrics* 2nd ed. (New York: John Wiley, 1988).

Kreitman, N. and S. Platt, "Suicide, Unemployment and Domestic Gas Detoxification in Great Britain," *Journal of Epidemiology and Community Health* 38(1984): 1–6.

Lester, D., "Completed Suicide and Females In The Labor Force," *Psychological Reports* 36(1973): 606.

Lester, D., "A Regional Analysis of Suicide and Homicide Rates in the USA," *Social Psychiatry and Psychiatric Epidemiology* 23(1988): 202–205.

Maddala, G. S., *Introduction to Econometrics* (New York: Macmillan, 1988).

Marks, S., "Multiple Roles and Role Strain: Some Notes on Human Energy, Time and Commitment," *American Sociological Review* 42(1977): 921–936.

Newman, J., K. Whittemore, and H. Newman, "Women in the Labor Force and Suicide," *Social Problems* 21(1973): 220–230.

Ogburn, W. F. and D. S. Thomas, "The Influence of the Business Cycle on Certain Social Conditions," *Journal of the American Statistical Association* 18(1922): 324–340.

Platt, S., "Unemployment and suicidal behavior," *Social Science and Medicine* 19(1984): 92–115.

Renshaw, V., E. A. Trott, and H. L. Friedenberg, "Gross State Product By Industry," *Survey of Current Business* (May 1988): 30–46.

Sieber, S. D., "Toward a theory of role accumulation," *American Sociological Review* 39(1974): 567–578.

Stack, S., "Suicide." *Social Forces* 57(1978): 644–653.

Stack, S., "The Effect of Female Participation in the Labor Force on Suicide: A Time Series Analysis, 1948–1980," *Sociological Forum* 2(1987): 257–277.

Stengel, E., "Suicide and social isolation," *Twentieth Century* 173(1964): 25.

Taylor, S., *Durkheim and the Study of Suicide* (New York: St. Martin's, 1982.)

Thomas, D. S., *Social Aspects of the Business Cycle* (New York: Knopf, 1927).

Vigderhous, G. and G. Fishman, "The Impact of Unemployment and Family Integration on Changing Suicide Rates in the USA, 1920–1969," *Social Psychiatry* 13(1978): 239–248.

Yang, B. and D. Lester, "The Participation of Females in the Labor Force and Rates of Personal Violence (Suicide and Homicide)" *Suicide and Life Threatening Behavior* 18(1988): 270–278.

Lenin, Then and Now

RICHARD LOURIE, who admits to studying Russia's "language, history and psychology for 30 years" and "being as baffled as anyone" commented (The *Boston Globe*, Sept. 8, 1991, 81–2) on the probability of normal burial for Lenin's mummy and "Lenin . . . for whatever faults he possessed, would have been sickened by