National Security, Income Inequality, and Economic Growth: A Cross-National Analysis*

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I. Introduction

The impact of the international environment on national development, economic performance, and income inequality is a major field of research within the dependency paradigm. While we do not want to dispute the legitimacy of such research, we want to break the near-monopoly of the dependency approach on world system—economic performance linkages. We want to investigate a different kind of linkage between world politics and economic growth or income inequality. Whereas most dependency theorists tend to argue that dependent or peripheral integration in the capitalist world economy by weak states reduces long-run opportunities for economic growth and egalitarian redistribution of income,[1] we focus on a proposition that almost certainly looks counterintuitive to some and morally unacceptable to others. Our basic proposition is: threats to national security promote economic growth as well as an egalitarian distribution of income. Or,

equivalenty, international tranquillity and peace may contribute to economic stagnation as well as to an unequal distribution of income. As bad as such a proposition may look, it nevertheless might be true.

Of course, we are not the only ones to entertain such ideas. Nor did we need to invent such propositions. The Polish-British sociologist Andreski[2] once suggested: "The technical and military circumstances, which make the willing cooperation of the masses in the war effort more or less essential, are the most powerful among the factors which determine the extent of social inequalities." Or, elsewhere, he comes close to stating this proposition in operational terms: "The height of stratification tends to covary with the M.P.R." (i.e., the military participation ratio). This claim has been supported by much historical and cross-cultural evidence of a qualitative kind. Moreover, it influenced later theorizing. While not making it the central explanatory variable of inequality and privilege, Lenski[3] nevertheless admitted it as one among others. Recently, cross-national and quantitative evidence in support of Andreski's claims has also been produced.[4] Israel, Taiwan, and South Korea may illustrate the positive end of the correlation between threats to national security and fairly egalitarian distributions of income, whereas Latin America may illustrate the negative end of the correlation between near-absence of threats to national security—because of Pax Americana—and some of the most unequal distributions of income to be found in contemporay societies.

While the proposed link between threats to national security on the one hand and a more equal distribution of income on the other hand, may need further theoretical elaboration, a promising theoretical start has been provided by Andreski.[5] By and large, he argues that threats to national security and military technology determine the military value of the common man. If military technologies necessitate large mass armies, if there are threats to national security, then ruling elites cannot avoid economic concessions to those who are enlisted, armed and needed for purposes of war—and who, once armed, become more dangerous to ruling elites if

·dissatisfied. So, the linkage between threats to national security and the size distribution of income is mediated by elite attitudes as well as the domestic balance of power between ruling elites and the masses.

Sketchy as this picture may look, it is more difficult to find as elaborate a "theory" concerning the proposed linkage between threats to national security and economic growth. Typically, one finds short comments made in passing. Two recent remarks by Herman Kahn[6] illustrate this: "One of the real difficulties that many developing nations labor under today is that they have no clear and present danger which they must face up to." Or, elsewhere he attributes the economic miracles of South Korea and Taiwan among other factors to "very unforgiving external political environments." Again, attitudes probably are intervening variables. A proposition made by the conservative German philosopher and social scientist, Arnold Gehlen,[7] may throw some light on intervening processes: "Evidently, war, economics and finance constitute the breeding ground for rationality. Here, necessity and corresponding constraints prevail." So, threats to national security may reinforce technocratic attitudes which also prove useful for economic performance. Similar convictions are entertained by Andreski[8]: "The sentiments of national solidarity, the habits of co-operation in a large mass and the concern for efficiency have undoubtedly been stimulated, if not created, by the wars which the European nations have waged during several centuries. And it may not be due to solely material advantages that the nations renowned for efficient military organization, like the Germans and the Japanese, have also been successful in catching up in the industrial race".

So far, our sample of authors may look somewhat biased in favor of the conservative end of the ideological spectrum. To remedy this, one may quote Ralf Dahrendorf[9]: "Military training on the Prussian pattern might be much more useful as a preparation for industrialism than Calvinist creeds might be even under optimal circumstances." In Dahrendorf's view, mass discipline learnt through military training rather than elite attitudes looks as the major intervening variable between threats to national security

and economic performance.

Moving further to the left on the ideological spectrum, the assumed inter-vening variables change again. But this does not necessarily call into question the positive impact which military competition among states has on economic growth. Writing in the spirit of Wallerstein's[10] world system approach, Moulder[11] comments on the divergent paths of economic development in Europe and the Far East. "War expenditures have been one of the most important causes of rising state indebtedness in the West from the sixteenth century to the present. And war expenditures in the West were associated with mercantilist economic policies that promoted capitalist industrial development.... In Tokugawa Japan, as well as in Ch'ing China before the nineteenth century Western expansion, large military expenditures did not accumulate after the initial pacification in the seventeenth century. Pax Tokugawa and Pax Ch'ing created an entirely different world from the European one, which has steadily alternated between warfare and armed peace for centuries." Here, neither elite attitudes nor mass discipline are used to explain the proposed relationship between international rivalry and economic growth, but war-related economic policies or their economic effects are.

By now, our sample of quotations should be large enough to underline two points: first, positive effects of threats to national security on economic growth and income equality have been proposed by a variety of social scientists of divergent ideological persuasions. Second, even where there is agreement on positive rather than negative effects, there is disagreement about their interpretation or about mediating processes and variables. In this research note, we do not attempt to clarify the nature of the linkage between international rivalry and economic growth or income equality. But we do want to find out whether such relationships exist and what their approximate order of magnitude might be. For this purposes, a larger list of quotations, even if it were to come from the most distinguished scholars, may be less useful than an empirical test.

II. Data and Analysis

There are three variables of theoretical interest to us and two testable propositions. The variables are threats to national security, income inequality and economic growth. The propositions are: 1. The greater the threat to national security, the more egalitarian the size distribution of income is likely to be. 2. The greater the threat to national security, the higher economic growth rates are likely to be.

What we need for a test of these propositions is indicators for variables of theoretical concern. Most difficult to operationalize is threats to national security. We assume that a history of much war experience in this century is related not only to past rivalries and international conflicts of interest, but is also a predictor of later troubles. In our opinion,[12] this continuity of security problems arises from three alternative sources. First, wars often lead to transfers of territorial control. Such transfers are resented by those who loose territory. Therefore, conditions of peace imposed by the victors on the vanquished are likely to reinforce rather than to reconcile conflicts of interest. Second, wars often result from security dilemmas of either neighboring countries or rival great powers. Neighborhood and great power status are fairly persistent through time, and so are related security dilemmas. Third, conflict, hostilities and war tend to be self-reinforcing processes. For all these reasons, we expect the history of war to be a predictor of present security concerns. Moreover, even if such a continuity of conflicts were not to exist, one might still argue that ruling elites are more likely to think of the possibility of war if their nation recently experienced some than if peace is their only historical experience. It should be remembered that elite perceptions and attitudes[13] are intervening variables in at least some of the theoretical sketches relating threats to national security to less inequality or more economic growth.

If threats to national security are perceived by ruling elites and decisions-

makers, we should expect them to do something about them. While one may argue about the wisdom in the age-old-prescription "si vis pacem, para bellum!", it is difficult to deny that statesmen frequently act accordingly. In our opinion, one may even argue that such a prescription is generally self-defeating[14] without necessarily denying its more or less general acceptance by policy-makers. For the purposes of our paper, it suffices to assume that decision-makers tend to allocate money and men to the military if they perceive threats to national security and if they have had war-experiences. While the history of war experience is a cause of threats to national security, allocations of men and money to the military are an effect thereof.

War experience refers to the 1900~1965 period and three indicators are easily available from the "Correlates of War"—project, i.e., number of wars fought, number of months war-involved, and number of battle-deaths suffered.[15] In order to reduce skewness, these indicators have been transformed according to the $\ln(X+1)$ formula.

Operationally, military preparation is either the military participation ratio, again $\ln(X+1)$-transformed to reduce skewness, or defense expenditure as a percentage of GNP, $\ln(X)$-transformed. Both indicators of military preparation refer to 1965.[16]

In cross-national research on income inequality, either Gini or percentage shares of quintiles or deciles are commonly used as indicators. While we previously worked with various quintile shares and Gini, we restrict our attention in this note to the personal or household income share of the most privileged quintile, of the top 20 percent. By and large, this income share is correlated no less than 0.9 with overall measures of income inequality such as Gini. Moreover, it is intuitively easy to understand. We take top 20 income shares ca. 1965 from two sources, i.e., from ILO data as published by Paukert,[17] and from World Bank data as published by Chenery and Syrquin.[18]

Finally, we need measures of economic growth. Here, we take GDP and

GNPC growth rates, as reported by the World Bank for the 1960~77 period.[19] Obviously, the growth indicators differ. Most importantly, GDP growth doesn't imply an increase in average wealth, whereas GNPC growth does. Therefore, we would expect GNPC growth to be more closely related to threats to national security than GDP growth.

In cross-national analysis, missing values are a widespread problem. This holds *a fortiori* where income inequality is included. We could find top 20 income shares in either one of our two data sources for 61 nations. For one of these, no GDP or GNPC growth rates are available. This brings us down to 60 nations. No Soviet-bloc nation is included. There are no missing values for war experience or military preparation indicators. Table 1 below lists bivariate correlations among our indicators of threats to national security, income inequality, and economic growth.

As is to be expected, the correlations among indicators of inequality, among indicators of war experience, among indicators of military preparation, and among indicators of growth are the highest to be found in Table 1. Correlations between war experience 1900~65 and military preparation in 1965 center around 0.4 only. Against this background of ca. 0.4 correlations between cause and effect indicators of threats to national security, similar correlations between indicators of threats to national security on the one hand, and GNPC growth rates on the other hand, as well as slightly lower—and negative, as predicted—correlations between threats to national security and inequality indicators look respectable, albeit still only moderately supportive of the two propositions advanced above. However, threats to national security indicators correlate poorly with GDP growth rates. While all indicators of threats to national security somewhat support propositions about positive effects on income distribution and growth rates, the military participation ratio stands out as the consistently strongest correlate.

In order to describe more parsimoniously the results presented in Table 1, as well as in order to move data analysis closer to theoretical thinking,

Table 1: Product-Moment Correlations between Indicators of Threats to National Security, Income Inequality and Economic Growth (pairwise deletion)

	inequality		war experience			military preparation		GNPC growth
	Chenery	Paukert	number	duration	battle-deaths	MPR	def./GNP	
Inequality, Chenery	—							
Inequality, Paukert	0.87	—						
number of wars	−0.25	−0.25	—					
duration of wars	−0.29	−0.20	0.89	—				
battle-deaths	−0.29	−0.26	0.93	0.94	—			
military participation(MPR)	−0.39	−0.39	0.44	0.39	0.46	—		
defense/GNP	−0.24	−0.35	0.39	0.35	0.44	0.68	—	
GNPC growth rate	−0.20	−0.13	0.41	0.38	0.41	0.58	0.24	—
GDP growth rate	0.10	0.11	0.19	0.14	0.18	0.36	0.14	0.83

one should somehow combine indicators of war experience, military preparation, and income inequality, as well as explicitly introduce the theoretical variable "threats to national security." This can be done by factor analysis.[20] Table 2 provides the results.

The pattern of factor loadings in Table 2a is extremely clear. All factors have high loadings where one would expect them, and truly negligible ones elsewhere. The factors have been named war, inequality, growth and military preparation. Not unexpectedly, the 0.45 correlation among past war experience and present military preparations is the highest to be found in Table 2b. For us, this highest correlation serves as a cue that both war and military preparation should be related to a more abstract concept, i.e., threats to national security. Both war and military preparation correlate ca. 0.3 with growth, but military preparation correlates slightly higher (−0.38) with inequality than with growth (0.29). Figures 1a and 1b provide a path analytic interpretation of the correlations from Table 2b.[21]

In both figures, past war experience serves as a cause of threats to national security and military preparation as an effect. Since the path coeffi-

Table 2a: Loadings (standardized regression coefficients) of Indicators on Oblique First-Order Factors

	F_1 War	F_2 Inequality	F_3 Growth	F_4 Military Preparation
Top 20 incomes Chenery	−0.04	0.99	−0.02	0.08
Top 20 incomes Paukert	0.04	0.87	0.05	−0.11
War number	0.92	0.01	0.02	0.03
War duration	0.98	0.00	−0.01	−0.05
War, battle-deaths	0.96	0.00	−0.01	0.05
Military Participation	0.02	−0.14	0.28	0.68
Defense/GNP	0.05	0.03	−0.09	0.87
GNPC growth	0.11	−0.13	0.95	−0.01
GDP growth	−0.05	0.13	0.88	0.03

Table 2b: Correlations between Oblique First-Order Factors

	War	Inequality	Growth	Military Preparation
War	—			
Inequality	−0.29	—		
Growth	0.29	−0.04	—	
Military Preparation	0.45	−0.38	0.30	—

cients in each figure have been estimated independently, the coefficients beween war and threats to national security, or between threats to national security and military preparation, differ slightly. Most relevant to our substantive concerns are the path coefficients between threats to national security on the one hand and inequality on the other hand. The squared path coefficients provide the proportion of variance accounted for, i.e., slightly more than one fifth in inequality and slightly less than that in economic growth.

While we did establish some correlations between indicators of threats to national security on the one hand, and income inequality or economic growth on the other hand, and while such correlations are compatible with our causal interpretation provided in Figure 1, one may question our interpretation by pointing to the need to control for other known or hypothesized determinants of income inequality or economic growth. There is no

Fig. 1a: An Interpretation of Relationships between War, Military Preparation and Inequality

Military Preparation

        0.77

                  −0.49
Threats to National Security————————→Inequality

          0.59

War Experience
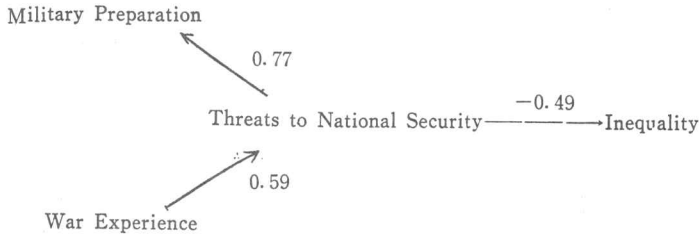
Note to Fig. 1a: All coefficients are path coefficients.

Fig. 1b: An Interpretation of Relationships between War, Military Preparation and Economic Growth

Military Preparation

        0.70

                 0.44
Threats to National Security————————→Economic Growth

          0.65

War Experience
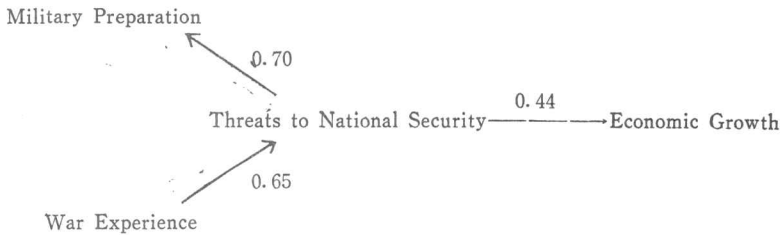
Note to Fig. 1b: All coefficients are path coefficients.

other cross-national correlate of income inequality equally as well-documented as level of economic development, operationalized by GNPC. [22] Conforming to Kuznets' early proposition, [23] the relationship is curvilinear and non-monotonic, i.e., we find maximum inequality at intermediate levels of development. A casual look through the recent *World Development Report* [24] suggests a similar curvilinear and non-monotonic relationship between level of economic development and growth rates, because we observe maximum growth at intermediate levels of development.

If level of economic development is fairly strongly related to both income inequality and economic growth, does the relationship between threats to national security and inequality or growth survive proper controls for level of economic development? If it did not, our above interpretation would be very much in doubt.

As it is cumbersome, to say the least, to deal with multiple indicators

and curvilinearity at the same time, we have to select best single indicators. The military participation ratio is an obvious choice for threats to national security, because it correlates better with inequality or growth than other indicators of threats to national security do. As GNPC growth correlates higher with threats to national security variables than GDP growth does, economic growth refers to GNPC in the analyses below. GNPC data for 1965 from the *World Handbook of Political and Social Indicators*[25] serve as measures of economic development. Top 20 income shares are averages of estimates where both sources provide information. Elsewhere, single available estimates are used.

There is some confusion about the proper specification of the economic development–inequality relationship. Econometricians typically prefer to regress inequality indices or income shares on ln GNPC as well as its square. This specification produces a much better fit than regression on either GNPC or ln GNPC alone, or GNPC and its square does.[26] Fortunately for the sake of simplicity, the very same specification turned out to be best for the economic development–growth relationship. Table 3 reports some results of our regression analyses.

In polynomial regression, level of economic development accounts for about one sixth of the variance in GNPC growth rates and one third in inequality. Explanatory success is reversed where the military participation ratio is the single predictor in bivariate analysis: about one third in growth rates and one sixth in income shares. Entering level of development and military participation jointly adds somewhat to the variance explained by the more successful predictor, but not much. All of the coefficients in the GNPC growth rates equation are significant beyond the 1 percent level, so are coefficients for simple and squared GNPC terms in the equation for top 20 income shares. However, the significance level of the military participation term in the latter equation is only 7%.[27]

Of central concern to this research note is the effect of threats to national security or their proxy, military participation ratios, on inequality and

Table 3: Adjusted Percentages of Variance Explained in GNPC Growth Rates or Top 20 Income Shares by Economic Development and Military Participation Ratios

	GNPC growth rate	Top 20 income shares
ln GNPC and its square only	16	34
ln (MPR+1) only	32	14
ln GNPC, its square, *and* ln(MPR+1)	39	37

economic growth. Controlling for level of economic development does *not at all* diminish the impact of military participation ratios on economic growth. The standardized regression coefficient of MPR is 0.59, that is, for practical purposes equal to the coefficient in bivariate regression (0.58). The situation is less clear-cut as far as top 20 income shares are concerned. Here, MPR is of borderline (7%) significance only, after proper controls for economic development are introduced. However, such a result should be evaluated in perspective. According to our experience with cross-national regressions of inequality measures on a wide variety of explanatory variables, there is hardly any predictor other than level of economic development that does a robust job. And military participation ratios do much better than other additional predictors, with the single exception at a dummy variable for Communist-ruled nations where they are included. [28] On this background, we claim *some*—albeit borderline—support for an egalitarian impact of threats to national security and/ or military participation ratios.

III. Conclusion

Counterintuitive or not, morally acceptable or not, this research note presents some *prima facie* evidence in favor of propositions which claim a *positive* impact of war experience, threats to national security, military preparation—and in particular, of military participation ratios—on both economic growth and the size distribution of income. We qualify our results as preliminary evidence only for a number of reasons.

First, correlation and regression analysis *can never prove* the existence of a causal relationship. While one may reason from a causal link to a pattern of permissible correlations and thereby test causal assertions, one also has to admit the possibility of alternative, and equally plausible, explanations. While our results are compatible with the argument that earlier war and present military preparations contribute to present income shares as well as present and future growth prospects, one could also argue that "some of the more important causes of war are rooted in the process of national growth." [29] Our results neither support nor contradict such views, nor can they give our design, its time periods or time points.

Second, one should certainly not place much confidence in any single piece of cross-national analysis. All too often, quantitative researchers find it difficult to replicate the results of others.

Third, even if the correlation between threats to national security or its indicators and economic growth or income inequality were demonstated to be robust, there would still be the problem of embedding threats to national security in more fully specified models of economic growth or income inequality. We make no claims that we come even close to full specification. Quite the contrary, we are aware of the limitations of our work. However, one can argue on the basis of our results that threats to national security should not be dismissed out of hand in any attempt to explain cross-national differences in economic growth and/or income inequality. [30]

Fourth, the theory of world politics–economic performance linkages is far from well-developed. We started more from something like a collection of hunches than from an explicit theory. Different mediating variables might explain the observed correlations. Our starting point has been an elite attitude interpretation. According to this, threats to national security enhance rational or technocratic elite attitudes conducive to economic growth as well as elite willingness to share income with masses needed to serve in mass armies. While this interpretation is certainly compatible with results, one may also point to the fairly high correlation between military partici-

pation ratios and economic growth. Possibly, mass attitudes are affected by military service. Possibly, armed forces are another school of modernization, in addition to the school itself and the factory.[31]

Then there are likely to be many hidden complexities. While defense burdens correlate positively with income equality and economic growth, one cannot rule out a negative direct impact of defense burdens on growth that is masked by a spurious positve correlation due to the joint dependence of defense burdens and growth on prevailing elite attitudes related to threats to national security. Or, one might look for economic variables intervening between allocations of men and money to the military and economic performance. So, positive correlations between threats to national security and egalitarian income distributions or economic growth constitute a theoretical problem instead of a solution to theoretical problems. But, on the basis of our research on income inequality and economic growth, we feel that threats to national security may be at least as important as dependency variables.[32]

Finally, the positive effects attributed to threats to national security in this paper should be expected to stay positive only as long as they remain threats—no more. In the past, wars fought did not help economic improvement. Nor did they produce a desirable kind of equality, rather than equality in death or impoverishment. And the nuclear age makes us expect worse consequences to come.

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7. Arnold Gehlen, *Moral und Hypermoral. Eine Pluralistische Ethik*(Frankfurt/ Main, Athenäum, 1969), 91-92; our translation.

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11. Frances V. Moulder, *Japan, China and the Modern World Economy. Toward a Reinterpretation of East Asian Development ca. 1600 to ca. 1918* (Cambridge: University Press, 1977), 81.

12. The views of the senior author of this research note on war are discussed in detail in Erich Weede, *Weltpolitik und Kriegsursachen im 20. Jahrhundert: Eine quantitativ-empirische Studie* (München: Oldenbourg Verlag, 1975).

13. We do not necessarily claim—Weede more so, Jagodzinski less so—that our notions about elite attitudes are realistic. However, we do argue that allocations of men and money to the military, elite concessions on income distribution and growth rates are related to previous war experience and to each other, *as if* elites held those perceptions and attitudes which we and most (albeit not all) authors quoted above attribute to them. Notions on elite perceptions and attitudes link (some kinds of) common sense theorizing to our testable propositions without being testable themselves within the constraints of a macroscopic research design.

14. As is done for example in Anatol Rapoport, *Strategy and Conscience* (New York: Harper and Row, 1964). Some relevant empirical findings are presented by Michael D. Wallace, "Arms Races and Escalation," *Journal of Conflict Resolution* 23, 1979, 3-16. On the interpretation thereof see Erich Weede,

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20. A standard source is Harry H. Harman, *Modern Factor Analysis*, 2nd rev. ed. (Chicago: University Press). We computed our results with SPSS 6, requesting four factors to be extracted and an oblique rotation thereof. Other specifications as implied by default options. We also tried a three factor solution which, however, did not provide easily interpretable results.

21. On path analysis with measured as well as latent variables, see for example: Robert M. Hauser and Arthur S. Goldberger, "The Treatment of Unobservable Variables in Path Analysis," pp. 81-117 in Herbert L. Costner, ed., *Sociological Methodology* 1971 (San Francisco: Jossey-Bass, 1971).

22. For empirical evidence see, for example: Montek S. Ahluwalia, "Income Distribution and Development," *American Economic Review* 66, 1976, 128-135. Hollis Chenery and Moises Syrquin, *Patterns of Development 1950-1970* (London: Oxford University Press, 1975). Erich Weede, "Beyond Misspecification in Sociological Analyses of Income Inequality," *American Sociological Review* 45, (June) 1980, 497-501. Erich Weede and Horst Tiefenbach, "Some Recent Explanations of Income Inequality", *International Studies Quarterly* 25, (June) 1981, in press. Erich Weede and Horst Tiefenbach, "Correlates of the Size Distribution of Income," *Journal of Politics* 43, (Novemer) 1981, in press.

23. Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations. VIII: The Distribution of Income by Size", *Economic Development and Cultural Change* 11, 1963, 1-80.

24. *Op. cit.*, note 19.

25. *Op. cit.*, note 16.

26. *Op. cit.*, note 22.

27. Elsewhere (*op. cit.*, note 4), we argued that ordinary regressions of inequality on GNPC and MPR may be misleading, because differences in reliability and

validity of independent variables are neglected. If GNPC is a more valid indi-
cator of level of economic development than MPR is of threats to national
security, as is suggested in some of our confirmatory factor analyses, then it
follows that ordinary regression analysis is likely to underestimate the effects
of threats to national security on less income inequality.

28. *Op. cit.* (Weede and Tiefenbach), note 22.

29. As has been done by Nazli Choucri and Robert C. North, *Nations in Conflict: National Growth and International Violence*(San Francisco: Freeman, 1975), 1.

30. While additional control variables conceivably might diminish the effects of military participation on economic growth and/or income inequality, we did not succeed in finding such variables despite an effort to do so. As far as income inequality is concerned, see Weede and Tiefenbach, *op. cit.*, note 22. As far as economic growth is concerned, see Erich Weede and Horst Tiefenbach, "Three Dependency Explanations of Economic Growth," Manuscript, or Erich Weede, "International Conflict, Human Capital, and Economic Growth," Paper to be presented at the Kyoto Symposium on Conflict Management, August 8–9, 1981.

31. School and factory as schools of modernization are discussed at length in Alex Inkeles and David H. Smith, *Becoming Modern. Individual Change in Six Developing Countries* (London: Heinemann, 1974). Why the military might serve as a school for modernization is argued in Lucian W. Pye, "Armies in the Process of Political Modernization," in: John J. Johnson, ed., *The Role of the Military in Underdeveloped Countries* (Princeton: University Press, 1962).

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