NOTES ON THE ECONOMIC SYSTEMS OF FORAGERS

This file of "additional notes" has four sections:

A. Determinants of Economic Systems
B. Defining other Economic Systems
C. My Coding of Variables Used in this Essay
D. The Codings of Others Used in this Essay

An EXCEL file of the codings used in my essay on foraging economic systems is found in the next file listed on this webpage.

A. Determinants of Economic Systems

It is certainly possible to explore the determinants of the ten individual dimensions of economic systems. For instance, we might hypothesize that market or barter exchange should have been more likely to occur in societies in which the products of the sea constituted a large percentage of the diet. If they had boats, the members of the society were more mobile and not only could come more easily into contact with other peoples but also carry goods to and from such transactions. Moreover, the more that fish and sea mammals constituted their foraged foodstuffs, the greater the dietary variety they might have obtained through trade or barter. Another hypothesis is that trade or barter was more likely to occur where substantial amounts of foodstuffs were stored, since this would have provided an important surplus for exchange. These two hypotheses receive support from a simple least squares regression analysis.[1].

Similarly, we might argue that the presence of taxation or tribute to the head of the local group was

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[1] The regression is (with standard errors beneath the coefficients and an asterisk designating statistical significance at the 0.05 level):

PME = 1.587* + 0.223* IF + 0.461* FS R^2 = .4050

(0.374) (0.058) (0.216) Size of sample = 44

where:

PME = presence of market or barter exchange (AT1-6)
IF = importance of fishing in the diet (AT2-9)
FS = food storage (AT1-9)

a function of the fixity of the local community, because in a mobile, society members might have had more opportunity to join other local groups to escape such exactions. Further, it seems likely that taxation or tribute would have occurred only in large groups and those dependent on hunting, since the products of fishing and gathering would have been more easily hidden from oversight by others. But, in fact, only the notion that fixity of residence is related to taxation/tribute receives support, the other variables do not.[2]

Such statistical exercises have, of course, some dangers. Given the phenomenon of cultural diffusion, many of the societies might not exhibit sufficient independence for standard methods to be used - Galton's problem. Although we can adapt a modified regression analysis to circumvent such difficulties (e.g., Pryor 1973), we must do so with care. Further, many of the explanatory variables that might be used are related to each other, which raises problems of multicollinearity and interpretation of the results. I could considerably lengthen this list of statistical difficulties.

It is also crucial to realize that although standard statistical techniques might isolate the causal determinants of particular dimensions of the economic system, it is of equal importance, and much more difficult, to isolate the determinants of the entire system, that is, to demonstrate why any particular configuration of systemic dimensions occurs. Such a task lies beyond the scope of this essay, in particular because the traditional ethnographic case study appears to be the most suitable approach for obtaining an answer. Why, for instance, do some societies feature a considerable inequality of tangible wealth, but relatively low levels of political centralization or emphasis value of intangibles. Case studies, rather than

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[2] Just looking at the fixity of residence variable, the regression is:

$T = -0.145 + 0.120^{*} FR$ $\quad R^2 = .1612$

$(0.110)\ (0.042)$ $\quad$ Size of sample = 44

where

T = presence of taxation/tribute (AT1-7)

FR = fixity of residence (AT1-18)

cross-cultural statistical analysis, would be more likely to provide the requisite insights. Further, up to now only a small number of ethnographic reports focus much attention on why particular features of other foraging societies do not occur in the one they are analyzing. Without such ethnological raw materials, however, the isolation of the causal determinants of particular economic systems cannot be carried out.

B. Defining Other Economic Systems.

Using ten dimensions of property relations and distribution mechanisms, I have isolated five economic systems. Although the minimum distance analysis suggests that five is the optimal number for such a cluster analysis, it is certainly possible to calculate three or eight clusters. For three clusters my experiments along these lines suggest that they are generally composed of one or two of my five clusters and, as a result, bunch rather heterogeneous societies together. For eight clusters experiments showed that, by and large, these consisted of several of my five clusters split into parts, creating distinctions of secondary importance; and, because I have data for only 44 societies, three of the derived clusters are made up of only two or three societies. .

It is, of course, quite possible to use other dimensions than those I have selected to define the economic system, in which case the end results might be somewhat different. An analogue can be found in the study of the economic systems of advanced industrial societies. If state ownership of the means of production is the criterion, two groups can be clearly distinguished ("capitalist" and "communist"), If governmental regulation and interference in the economy are the criteria, two groups again can also be distinguished ("free market" and "planned"), but the countries composing the two clusters would not be exactly the same as in the first case. Similarly, in another study of foraging societies, the dimensions I have used to define the economic system might not be relevant for the problem under investigation, and new typologies of economic systems would have to be defined.

C. My Coding of Variables Used in the Essay

The codings in Table AT1 were made usually from primary ethnographic sources. In some cases the author would make some factual statement or evaluation which I found difficult to understand or interpret and, as a result, I am not completely sure about my codings. For each characteristic of the society I provide two pieces of information: the rating and my (subjective) confidence in how closely my coding corresponds with what the ethnographer recorded, with A = quite confident; B = somewhat confident; C = not at all confident (my ratings may represent only an educated guess or interpolation). For some variables, such as sharing, I am not very confident in the accuracy of the original sources and, as indicated in the notes about them. The number of each paragraph of explanation designates the corresponding data column in the table.

1. Name of society. From Murdock and White (1969).

2. Number of society in the Standard Cross-Cultural Sample. From Murdock and White (1969).

3. Economic system. These evaluations are derived from the cluster analysis. 1 = classic foragers; 2 = transition foragers; 3 = unequal-politically foragers; 4 = unequal-socioeconomically foragers; 5 = unequal-intangibles foragers. A 'B' in column 3b indicates that in the course of six runs of the cluster program, that particular society ended up in several different clusters. As indicated in the text, in these cases I placed the society in that cluster where it was most often found. A 'C' in column 3b likewise indicates that the six runs of the program did not always assign the society to the same cluster, but that I placed it in that cluster where, on the basis of other information, I felt that it most belonged.

4. Distribution of wealth: 1 = general equality; 2 = some differences in wealth; 3 = considerable differences in wealth. These codings are quite subjective on my part since ethnologists have different standards as to what constitutes a significant difference in wealth.

5. Food sharing/redistribution: This variable runs from 0 through 4 and is a composite including both food shared on-the-spot where foraged and food shared-in-camp. These two components receive weights of one-third and two-thirds respectively. On-the-spot food sharing was estimated by determining the customary rules for sharing foraged foodstuffs foraged through gathering, hunting, and fishing respectively and then weighting the results by the percentage of food coming from each source (AT2-7 through 9). The food shared-in-camp was a rough estimate, as it was difficult to quantify the vague adjectives used by the ethnographer to describe the situation. The confidence ratings in column 5b reflect how well I believe that I captured what the ethnographer meant; because of different standards used by the ethnographers, I do not have a great deal of confidence in the overall ratings. In some societies (but not in the sample), food is redistributed through the chief. This represents a type of food sharing-in-camp.

6. Market exchange or barter. Market exchange appeared to form a Guttman scale: little internal market exchange occurred in the absence of considerable external market exchange, while the reverse did not hold. 1 = little or no market exchange; 2 = market exchange but primarily with few external traders; 3 = market exchange with many external agents (a = significant amount of food obtained through exchange); 4 = external market exchange plus some internal market exchange as well; 5 = considerable internal and external market exchange.

7. Taxation or tribute. 0 = political leader had no special rights to part of foraging produce of others; 1 = political leader had special rights to part of foraging produce of others, which can either be redistributed or kept for personal use.

8. Possession of land. A composite variable running from 0 through 4. Calculated by recoding column AT1-14 (recoded so that 0 = no territoriality; 1 = territory claimed by tribal; 2 = territory claimed by subtribal group, such as band; 3 = territory claimed by small or large family group) and column AT1-15

(recoded so that 0 = private ownership by nuclear families or individuals of land non-existent, unimportant, or not critical; 0.5 = private ownership of large areas or formal land claims; 1 = all or important parts of land privately owned). These two recoded variables are then summed.

9. Food storage. 1 = no storage or short-term storage (for several days) or storage only of luxury foods; 2 = food storage in one season to last over other seasons for nourishment purposes; 3 = food storage covering more than a year's nourishment needs (surplus could be used for other purposes such as ceremonial use).

10. Slave holding. 1 = no slaves at focus date (an 'a' indicates slavery in the past); 2 = presence of slaves, but usually held only by elite; 3 = presence of slaves and all could hold. If male war captives were treated well (for instance, among the Abipone) so that they would not flee, or if female war captives given to men in the society but were not treated differently than other wives, I code these cases as 1.5 . In some cases, such as the Yukaghir, it proved difficult to determine the extent of slavery and how far back in the past it was given up. For the analysis in the text, I counted those foraging societies that practiced slavery in the past as "slave-holding" because of the way in property rights were structured, even if a particular type of property was no longer recognized. It turned out that this decision had no impact on the results.

11. Property in intangibles, especially curing techniques. 1 = knowledge widely shared; 2 = knowledge specialized but economically unimportant to owner; 3 = knowledge specialized and constituted an important source of income. In some cases it was reported that curers were paid or given a present, but the amount of the payment was unclear. In this case, I had to make a guess about the extent from the context of the activity.

12. Extent of bridewealth. 1 = none, small gifts, mutual exchange of gifts, or a substitute form of compensation such as bride service; 2 = some, but not significant wealth involved; 3 = significant wealth

involved.

13. Inheritance of movable property. 1 = very little; most movable property destroyed or buried with corpse; 2 = some property inherited, some destroyed or buried; 3 = significant share of movable property inherited.

14. Territoriality and predominant unit of land holding. 0 = no significant territoriality; 1 = territory claimed by tribe as a whole; 2 = territory claimed by subgroups of tribe larger than the band; 3 = territory claimed by band or local group; 4 = territory claimed by extended family, gens, or clan; 5 = territory claimed by small families or individuals.

15. Importance of private land holding by individuals or families. 1 = private land either non-existent, unimportant, or casual; 2 = particular (non-critical) areas or sites held private, such as individual trees; 3 = large areas held privately, but also some large community land; 4 = most land divided privately (individuals or families).

16. Political centralization. A composite variable running from 0 through 4 equally weighting the political leader's relative wealth; the power of the political leader (leader was weak and operated though influence, weak and worked with a council, strong but worked with a council, strong and ruled alone); the formal nature of political leadership (leadership was informal, leader selected in semi-formal or formal process, or leadership inherited); and extent of power (strictly local, over several local groups, or over tribe).

17. Social differentiation of free individuals (i. e., excluding slaves). 1 = general egalitarianism; 2 = individuals or families ranked; 3 = at least two distinct classes with considerable inheritance of status. There were no societies with castes.

18. Fixity of residence/nomadism. The basic distinction is between societies with and without permanent homes. Among the former, some societies roamed the entire year (= 1), while others had a

"stationary encampment" for some months and then roamed the remainder of the year (= 2). Among groups with this fission-fusion pattern, it is often possible to distinguish those societies where the whole group roamed and came together (= 2a), those where the stationary encampment was larger than the roaming group (= 2b), and those where the stationary encampment was smaller than the roaming group (= 2c). In some cases no information was available on this matter (= 2d). Among societies having a permanent home, it is often possible to distinguish between those who were nomadic during part of the year (= 3), those who moved between 2 or more permanent homes (= 4), and those with a single permanent home from which they seldom moved away.(= 5a if community periodically moved; = 5b if remained in same location for many years).

19. Average size of most significant local group. The population codes are: 1 = < 50; 2 = 50 - 99; 3 = 100 - 149; 4 = 150 - 199; 5 = 200 - 249; 6 = over 250. Unfortunately, for certain societies, the estimates by others of "size of community" for certain societies vary enormously with each other (an extreme example is the Tehuelche, see Cooper 1946: 144 ff). It seems likely that for nomadic societies exhibiting an annual fission-fusion pattern of residence, the community population data may refer to the society during different phases of this process. Because anthropologists differ in their definitions of "tribe," "band," "camp," and "local group," it is necessary to specify my concepts more concretely. I define the "local group" as the agglomeration of people whose members spend the most time together; "band" as the grouping which combine the local groups for at least several months of the year (the band and the local group may be coterminous); and "tribe" as a group of bands with a sense of social identity. My "community size" variable refers only to the local group. For those nomadic societies exhibiting a fission-fusion pattern (coded 2 in column 18), I append an 'a' to designate that the larger assemblage was the local group and a 'b' when the smaller assemblage was the "local group." For other cases, this ambiguity does not arise.

20. Contact with the West. This coding refers only to the pinpointed year, since contact with the West varied greatly over time. 1 = relatively little contact with white traders, missionaries, or officials 2 = sufficient contact with white traders, missionaries, or officials to have an important impact on the economy.

21. Presence of gambling. 0 = none or little; 2 = some; 3 = considerable. In many cases the ethnographies did not mention gambling. Sometimes, however, games in general were described in detail and if gambling was not mentioned, so we can be fairly sure (= B) that it did not occur. Sometimes, gambling was not mentioned, and it also did not seem consistent with the rest of the daily life described in the ethnographies, in which case I guessed that gambling did not occur and gave this coding a rating of C. In some cases (coded 1.5), gambling occurred among some groups of the society but not others; in other cases (coded 2.5), gambling occurred but its importance is difficult to judge.

22. Presence of potlatch. "Potlatch" covers those ceremonies in which large quantities of property are given away or destroyed by the owner to demonstrate the owners wealth and thus prestige. 1 = not present; 2 = present but property given away and not destroyed; 3 = property either given away or destroyed. Many of the sample societies held feasts, dances, or other ceremonies in which gifts were given; coding problems arise in deciding how extensive and institutionalized such gift giving was.

23. Rights in women. 1 = women have sole right to choose own husband; 2 = family has dominant rights in selecting a woman's husband; 3 = men in the family use their rights in determining a woman's husband to obtain a spouse for themselves. Overall I am uncertain about these codings, because it not clear in the original sources whether, and to what degree, a women could refuse to enter into the marriage arranged for her.

24. Transportation of stored food. 1 = no storage or stored food carried on back; 1a = no storage, although transportation was available; 2 = use of horses, sleds, or boats to transport stored foods;

2a = food storage occurred but transportation was not necessary since the group was settled in a single location or the distance between permanent homes was not very great.

25. Demand-sharing. 1 = yes, if an article was requested in some way, it was usually handed ever. This could occur in the form either of direct asking, considerable scrounging, or tolerated theft. 2 = demand-sharing occurred only for certain goods, for instance, food; 3 = demand reciprocity - if an article was requested, the recipient gave a gift before asking; 4 = only the chief or leader required to honor requests; 5 = no demand-sharing. This variable was difficult to code, in major part because most ethnologists did not directly record such information and it was necessary to read between the lines.

D. Coding by Others of Variables Used in this Essay

Many of the codings in Table AT2 are taken from World Cultures - Special CD (2001). In the explanation below, I use the letter 'V' to designate the number of the variable on this disk. I also include the original source of the coding. The number starting each paragraph of explanation designates the column in table AT-2 to which the paragraph refers. A blank space indicates that no coding was made.

1. Name of society. From Murdock and White (1969).

2. Number of society in the Standard Cross-Cultural Sample. From Murdock and White (1969).

3. Pinpointed date. V838, originally from Murdock and White (1969).

4. Region. From Murdock and White (1975). 1 = Africa; 2 = Asia; 3 = Oceania/Australia; 4 = North America; 5 = South America.

5. Latitude. From Murdock and White (1975). A negative number designates the Southern Hemisphere.

6. Cultural complexity. This variable was calculated from estimates of societal scale (or

complexity) by Robert Carneiro (1970 and unpublished data), who takes into account many hundreds of cultural traits, and the less complete calculations by Murdock and Provost (1973), who take into account ten traits. The starting point was the unpublished sixth edition of Carneiro's calculations, which he generously supplied me. In this list I interpolated results from Carneiro's published fourth edition (1970) and fifth edition (reported as variable 22 in Pryor 1977: 337). Altogether, the combined Carneiro samples include 72 of the 186 societies in the SCCS. Fortunately, the Carneiro and Murdock-Provost scales are highly correlated: when both are transformed into logarithms (which reduces problems of curvature of the scales), the correlation coefficient is 0.93. The Murdock-Provost values, therefore, could be interpolated into the Carneiro scale.

7. Percentage of gathered foods in subsistence. V203 (converted to a percentage), originally from Murdock, published in various installments in Ethnology. Murdock apparently made these estimates on the basis of the bulk of the food, rather than nutritional content.

8. Percentage hunted products in subsistence. V204 (converted to a percentage), originally from Murdock, published in various installments in Ethnology. Murdock apparently made these estimates on the basis of the bulk of the food, rather than nutritional content.

9. Percentage of products from fishing and water mammal hunting in subsistence. V205 (converted to a percentage), originally from Murdock, published in various installments in Ethnology. Murdock apparently made these estimates on the basis of the bulk of the food, rather than nutritional content.

10. Effective temperature. Derived from a formula discussed by Kelly (1995, p. 66), this measure provides :a simultaneous measure of the intensity of solar radiation as well as its annual distribution." It is derived from data of the mean temperature of the hottest and coldest months, V187 and V188, originally

from unpublished data of John Whiting.

11. Evapotranspiration. A measure of available annual water supply, taken from data from the nearest weather station and presented by Thornthwaite and Associates (1962-65).

12. Famine threat. An unweighted average of V1265, V1267, V1683, and V1685 after all variables have been recoded on a four point scale. The original data come from Dirks (1993) and Ember and Ember (1992).

13. Agricultural potential. A synthetic indicator running from 4 (low potential) to 23 (high). The original data come from Pryor (1986).

14. Female power. V663, originally from unpublished data of Sanday (1981). The data are a Guttman scale of six measures of female power running from 1 (low) through 7 (high).

15. Male aggression. V669, also originally from Sanday (1981). The data are a Guttman scale of five measures of male aggression running from 1(low) through 6 (high).

16. Composite of male dominance. V670, also originally from Sanday (1981). This is a composite measure derived from data from columns 14 and 15, where 1 = sexes equal (5 or above on the female power scale, 4 or below on the male aggression scale); 2 = "mythical male" (5 or above on the female power scale, 5 or above on the male aggression scale); 3 = sexes unequal (4 or below on the female power scale).

17. Female contribution to subsistence. V890. This is an average of separate estimates by Barry and Schlegel (1982), Whyte (1978), and the Ethnographic Atlas.

18. Descent. V70, originally coded by Murdock and Wilson (1972) but categories combined. 0 = no corporate descent; 1 = corporate descent groups (matrilineal, patrilineal, ambilineal, or double descent).

19. Household form. V67, originally coded by Murdock and Wilson (1972). 1 = large communal structures; 2 = multi-family dwellings; 3 = single-family dwelling or homestead or multi-dwelling household, each with married pair; 4 = separate households for each wife or households where occupied only by individuals.

20. Family form. V68, originally coded by Murdock and Wilson (1972). 1 = basic husband-wife unit, either monogamous or polygynous; 2 = stem family; 3 = small extended family; 4 = large extended family.

21. Marriage form. V68, originally coded by Murdock and Wilson (1972). 1 = monogamous, no polygyny; 2 = primarily monogamous, less than 20 percent of marriages polygynous; 3 = more than 20 percent of marriages polygynous.

22. Marital consideration. V208, originally coded by Murdock for the Ethnographic Atlas. 1 = brideprice or bridewealth paid to bride's family; 2 = bride service to bride's family; 3 = gift exchange, token brideprice, or exchange of female relative; 4 = dowry to bride from her family.

23. Post-marital residence. V69, originally coded by Murdock and Wilson (1972). 1 = matrilocal or uxorilocal (with wife's kin); 2 = ambilocal (with either wife's or husband's kin) or neolocal (separate from kin); 3 = avunculocal (with husband's mother's brother's kin); 4 = patrilocal or virilocal (with husband's kin).

24. Cousin marriage. V227, originally coded by Murdock for various installments of Ethnology. 1 = marriage allowed to all four cousins; 2 = marriage allowed with three of four cousins; 3 = marriage allowed to two of four cousins; 4 = marriage allowed with one of four cousins; 5 = marriage not allowed with first cousins but perhaps with second cousins; 6 = marriage not allowed with first or second cousins.

25. Overall frequency of warfare. V1648, originally coded by Ember and Ember (1992) but

condensed. 1 = low (Ember scale, 1 to 3); 2 = medium (Ember scale, 3 to 6, which represents warfare once every 3 to 20 years); 3 = high (6 to 18 on the Ember scale, which represents warfare more often than once every three years)..

26. Frequency of internal warfare. V1649. See above for source and codings.

27. Frequency of external warfare. V1650. See above for source and codings.