

A RAND NOTE

HOUSEHOLD COMPOSITION AND INTERHOUSEHOLD
EXCHANGE IN MALAYSIA

William P. Butz, Peter J.E. Stan

July 1982

N-1812-AID

Prepared for

The Agency for International Development

Rand
SANTA MONICA, CA. 90406

This research was supported by the U.S. Agency for International Development under Contract No. AID/OTR-G-1822.

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PREFACE

This Note was prepared with support from The Rand Corporation's Family in Economic Development Center. The Center is funded through grant number AID/otr-1822 from the Agency for International Development. Its purpose is to provide effective policy research by integrating technical research with training of, and collaboration with, Third World scholars and government officials. The Center's research emphasizes the role of human resources in the process of economic development, and individual and family responses to development programs and policy. The survey data analyzed in this Note were gathered under contract number AID/pha-1057 between AID and Rand. Neither AID nor Rand necessarily endorses the findings.

This Note describes the extent and nature of informal transfers of money, goods, and help among households in Peninsular Malaysia. It should interest persons concerned with household structure, informal credit markets, and economic networks in less developed countries.

A version of this Note will appear in the Population and Development Review, Supplement, forthcoming.

SUMMARY

Several phenomena of research and policy interest in less developed countries are integrally related to the nature of resource transfers among households. Information on these transfers has heretofore been available almost exclusively from anthropological village studies. This Note introduces a new dataset from a national survey of about 1200 households in Peninsular Malaysia. The dataset documents flows of money, goods, and help between persons in these households and other persons outside.

Although we present aggregated information on the nature and importance of these "informal" transfers of resources, our principal purpose here is to describe the microstructure that supports these aggregates. Which types of household members transfer resources to and from which types of persons living outside? Do the transfers comprise money, goods, or time (help)? And how do these transfers and the entire exchange networks they form differ among the two principal ethnic groups, Malays and Chinese; across rural, urban, and metropolitan communities; and by the composition of households?

We investigate these questions using a data reduction technique not previously used to analyze resource flows. The technique is blockmodeling, implemented through a hierarchical clustering scheme called CONCOR. In our case, CONCOR partitions actors inside and outside the household into blocks. The members of a block are similar with respect to the extent and nature of their participation in the exchange networks. By running CONCOR on selected subsamples of households, we can inspect how the structures of exchange networks differ.

Informal transactions through interhousehold exchange networks are significant, relative to household incomes, in Malaysia. For poor households, these transfers are indeed substantial. Most of the transfers are monetary, but a sizable quantity consists of various kinds of help. Transfers of goods are considerably less important. The empirical literature on aggregate savings functions in less developed countries ignores these transfers. So do most studies of income distribution.

The CONCOR algorithm produces blockmodels from these data that are generally interpretable. Breaking the sample down by ethnicity, ruralness of community, and type of household structure, CONCOR reveals microstructures of exchange networks that vary considerably in the importance of particular household members, outside acquaintances, and exchanges of money, goods, and time.

ACKNOWLEDGMENTS

We are grateful to Cathy Kasala and Terry J. Fain for programming assistance. We also thank Yoram Ben-Porath, Nancy Birdsall, Mead Cain, Jack Caldwell, Julie DaVanzo, Jack Goody, Reuben Gronau, Robert Willis, and members of the UCLA Labor Economics Workshop for helpful comments on an early draft. All remaining errors are our responsibility.

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I. INTRODUCTION

A number of diverse phenomena of research and policy interest in less developed countries are integrally related to the nature of resource transfers among households. Rural-urban and international migration (Hugo, 1981), urban assimilation (Hugo, 1981), household composition (Ben-Porath, 1980), the personal distribution of income (Kusnic and DaVanzo, 1982), and national foreign exchange positions are among these phenomena. Caldwell has argued that the demographic transition itself occurs because of a change in the direction of resource transfers between parents and children. (Caldwell, 1976; 1980)

Information on these transfers is available almost exclusively from anthropological village studies.[1] Although in many cases these data are apparently quite thorough and reliable, they suffer two deficiencies for purposes of studying these phenomena. First, these studies frequently focus on interhousehold transfers associated with ceremonial

[1] In 1925, Mauss published the classic anthropological study of interhousehold exchange of gifts in peasant societies. Its descriptive detail and interpretive richness make it still essential reading, although only societies in Polynesia, Melanesia, and northwest America are explicitly described (See Mauss, 1967). More recently, Orlove (1977), Lomnitz (1977), and Stack (1974) have provided detailed accounts of resource transfers among households in areas of Peru, Mexico, and the United States, respectively. Belshaw (1965) provides a useful review of other village studies. He emphasizes the widespread economic and social importance of interhousehold transfers in less developed countries and the reciprocal nature of these transfers. Donald (1976, Chapter 8) is a thorough review of economic data on informal sources of credit, primarily moneylenders, in rural areas of developing countries.

occasions such as births, puberty rites, weddings, and funerals, missing thereby whatever transfers occur routinely in everyday life. The other deficiency lies in their small sample designs. Because of limited variation in important variables across the families in a study, and limited comparability of data and methods across studies, it is often difficult to make inferences to the regional or national levels where policy concerns are focused.

This Note introduces a new dataset from a national survey of about 1200 households in Peninsular Malaysia. The dataset documents flows of money, goods, and help between persons in these households and other persons outside. Although we present aggregated information on the nature and importance of these "informal" transfers of resources, our principal purpose here is to describe the microstructure that supports these aggregates. Which types of household members transfer resources to and from which types of persons living outside? Do the transfers comprise money, goods, or time (help)? And how do these transfers and the entire exchange networks they form differ among the two principal ethnic groups, Malays and Chinese; across rural, urban, and metropolitan communities; and by the composition of households?

We investigate these questions using a data reduction technique not previously used to analyze resource flows. The technique is blockmodeling, implemented through a hierarchical clustering scheme called CONCOR. In our case, CONCOR partitions actors inside and outside the household into blocks. The members of a block are similar with respect to the extent and nature of their participation in the exchange networks. By running CONCOR on selected subsamples of households, we can inspect how the structures of exchange networks differ.

This Note describes the quantity, composition, and direction of resource transfers among Malaysian households, making comparisons by ethnic group, by ruralness, and by nature of household extension. We do not directly address the social and economic functions that these transfers may perform.[2] However, in relating them to the phenomena listed above, we are inclined to take as a maintained hypothesis the principal conclusion of Mauss's intensive analysis (Mauss, 1967):

[These] presentations are in theory voluntary, disinterested and spontaneous, but are in fact obligatory and interested. The form usually taken is that of the gift generously offered; but the accompanying behavior is formal pretence and social deception, while the transaction itself is based on obligation and economic self-interest.

II. DATA

We use data from the Malaysian Family Life Survey (MFLS), conducted in 1976-77 in Peninsular Malaysia. The sample consisted of private households that each contained at least one ever-married woman less than 50 years old at the initial visit. These households were contained in 52 primary sampling areas in Peninsular Malaysia, 49 of which were selected by area probability sampling methods.[3]

[2] In another paper (Butz and Stan, 1982b), we relate these transfers to families' motives to borrow and lend and to insure.

[3] The MFLS was designed by researchers at The Rand Corporation in collaboration with, initially, persons at the Department of Statistics of the Government of Malaysia, and subsequently, the staff of Survey Research Malaysia, which did the field work. The survey comprised three rounds, four months apart, and lasted one year beginning in August 1976. Eleven questionnaires were administered once or several times throughout the survey. A total of 1262 households completed round 1 of the survey, and 1207 households completed round 3, in which the Networks of Economic Support questionnaire (MF9) was administered. For more information about the MFLS, see Butz and DaVanzo (1978) and references cited therein.

Most data in this analysis are from the Networks of Economic Support questionnaire. This questionnaire's purpose was to document transfers of money, goods, and help between persons in the sample households and their relatives, friends, and acquaintances outside the household. The questionnaire documents the types, amounts, and directions of transfers occurring any time in the previous 12 months, as well as the obligations incurred because of the transfers. Other related information was also recorded. The primary respondent for this questionnaire was the female head of the household.

Even in intensive long-term anthropological investigations of resource transfers among only a few dozen households, Hugo (1981) finds significant underreporting of transfer occurrences and amounts. The MFLS information on transfers must be even less complete because of the large sample size, a survey instrument that was standardized and precoded, and the multiple purposes of the survey, only one of which directly concerned interhousehold transfers. Apart from this presumed underreporting of transfers among households, the MFLS data do not document any transfers among persons within households. Hence it is impossible in these data to characterize fully resource-flows between, say, parents and children. These flows are hidden as long as persons live in the same household, emerging in the data only when household members separate. This interplay between the composition of households and their external transfers is one of our major themes, but it can be developed only crudely without complementary information on intrahousehold transfers of resources. Unfortunately, such data are scarcely to be found anywhere.

Even with these limitations, the MFLS data on transfers are voluminous and detailed. Approaching this quantity of information analytically requires aggregation in at least three dimensions: across types of persons inside the household, across types of persons outside the household, and across types of transfer. Table 1 shows the detail in the original data by type of person and type of transfer, as well as the aggregated categories used here. Note that household members are categorized more narrowly in the raw data than are outside actors. The former are also identified by survey ID numbers that link them to other personal information in the household roster and other questionnaires. We have made use of the age information in the roster to partition the male and female heads into seven age categories each. Except for the children of male and/or female head, the data set contains no additional information on the persons identified as outside actors. Hence, these persons are coded into relatively few categories in the original data. For this analysis, we placed household members into the 20 categories indicated in Table 1 and outside actors into the indicated 8 categories.[4] As Table 1 indicates, seven specific types of transfers are identified in the original data. We aggregate these into three: money, goods, and time (or help).

Each individual transfer in the original data takes place between one household member and one outside actor. Each transfer is either "in" from an outside actor to a household member, or "out" from a

[4] Where many original categories are combined into one group, each of the original categories was involved in relatively few transfers. The exception is the recoded household category, "children (and other relatives)," which contains one important group, children, and many very unimportant ones.

Table 1

CATEGORIES OF PERSONS AND TYPES OF TRANSFER IN THE RAW MFLS DATA AND IN THIS ANALYSIS

| Categories of Household Members | | Categories of Outside Acquaintances | | Type of Transfer | |
|---|---|--|-----------------------------------|------------------------------------|---------------|
| Original Data | This Analysis | Original Data | This Analysis | Original Data | This Analysis |
| Male Household head | 7 age categories | Children of male and/or female head | Children | Money | Same |
| | | Grandchildren of male and/or female head | | Goods | Same |
| Female household head | 7 age categories | Parents of female head | Same | Child care, housework or marketing | |
| | | Parents of male head | Same | | |
| Children of head & wife | Children (and other relatives) ^a | Brothers/sisters of male or female head | Brother, sister, nieces & nephews | Help in fields | Time |
| Children of female head only | | Nieces/nephews of male or female head | | Help in cottage industry | |
| Children of male head only | | | | | |
| Adopted children | | Cousins of male or female head | Cousins, aunts and uncles | Other work outside house | |
| Sons- and daughters-in-law of male or female head | | Aunts or uncles of male or female head | | Other | |
| Grandchildren of heads | | Male household head | Other relatives | | |
| Adopted grandchildren of heads | | Female household head | | | |
| Brothers/sisters of male head | | Grandparents of male or female head | | | |
| Brothers/sisters of female head | | Other relatives | | | |
| Nieces/nephews of male head | | Friend | Same | | |
| Nieces/nephews of female head | | Other non-relative | Same | | |
| Father of male head | Same | | | | |
| Mother of male head | Same | | | | |
| Father of female head | Same | | | | |
| Grandfather of male head | Grandparents | | | | |
| Grandmother of male head | | | | | |
| Grandfather of female head | | | | | |
| Grandmother of female head | | | | | |
| Uncles/aunts of male head | | | | | |
| Uncles/aunts of female head | | | | | |
| Other related individuals | | | | | |
| Servants/helpers | Not included because were not involved in transfers | | | | |
| Families of servants/helpers | | | | | |
| Non-related boarders | | | | | |
| Non-related visitors | | | | | |

Notes: (a) Nearly all the transfers in this category involved children.

household member to an outside actor. Many specific pairs of household members and outside actors were involved in more than one transfer of the same kind (money, goods, or time) and direction. In these cases, we sum the dollar values of each in the 12 months prior to the interview. Hence, our aggregated data comprise, for each household in the sample, six matrices of dimensions 20 by 8: one matrix each for money transfers-in, goods transfers-in, time transfers-in, money transfers-out, goods transfers-out, and time transfers-out. Each matrix contains 160 elements, one for each of the possible pairwise combinations of transfers between a type of household member and a type of outside actor. Each element is the dollar amount transferred in the 12 months before the interview date.

It is useful to denominate these elements in Malaysian dollars.[5] Because survey respondents reported the value of money and goods transfers in dollar terms, only the time transfers were a problem. Respondents reported these in hours, days, weeks, or months; we transformed these durations into dollar terms using hourly wage imputation regressions.[6]

[5] One Malaysian dollar equalled about 43 U.S. cents in 1976.

[6] Considerable information could be included in the imputation for time transfers-out, because many characteristics of household members are recorded in the data. For time transfers-in, on the other hand, we know only the category of outside actor. We therefore assumed that all outside actors were of the same ethnic group as the household head. We estimated the age of each outside actor using sample information on the average age difference between a person of the particular outside type and the household member he or she is referenced to, in conjunction with the age of that particular household member. For example, a "parent of female head" outside a Chinese household was assumed to be Chinese and 24 years older than the particular female head. This parent was then assigned the mean wage of Chinese persons of that age in that geographic region, and his or her time transfers-in were valued at that wage. Cousins and friends outside the household were assumed to be the mean age of the male and female heads. Even apart from these considerable approximations, well-known conceptual and statistical difficulties

Because its principal purpose was to study fertility, the survey sample was restricted to households containing at least one ever-married woman less than 50 years old at the date of interview. The sample is a national probability sample of these households, but, as such, is not representative of Malaysian households in general. The principal implication of this sample characteristic for the present analysis is that households headed by elderly couples are under represented. Because these households can only have been selected if they also contained a woman younger than fifty, elderly persons living apart from their children appear only as outside actors in these data.

Our full sample contains 1181 Malay, Chinese, and Indian households. The analyses focusing on ethnic differences include the 992 Malay and Chinese households, and omit from consideration the remaining 189 Indian households. Twenty-six households were dropped from the full round 3 sample because of severe missing data problems. A number of other households were missing minor component information on one or more specific transfers; we imputed the missing information as appropriate.

III. AGGREGATE PATTERNS OF NETWORK EXCHANGE

Table 2 shows average dollar values of network transfers by type and direction of transfer. Both average sizes of transfers and average amounts transferred over all households are shown. The latter, in columns (2) and (4), are much smaller because many households in the sample reported no transfers.

attend this imputation method of estimating the value of time. We ignore these in the analysis and in discussion, since no alternative method presents itself as possible in this situation. The results reported below show no apparent artifacts of the imputations.

Considerably more households reported transfers-out than transfers-in. One might suspect that respondents underreported the latter type because of pride or desire to hide income. However, the transfers-in that were reported were much larger than the transfers-out. In value terms, Malaysian households appear in Table 2 to transfer primarily money through exchange networks, secondarily time, and to the least extent goods. However, more households are involved in time transfers than in either of the other two, though time transfers appear to be of less money value than direct money transfers.

The distribution of transfers-in across money, goods, and time is extremely similar to the corresponding distribution of transfers-out.

Table 2

AVERAGE DOLLAR VALUE OF NETWORK TRANSFERS, BY
TYPE AND DIRECTION
(number of households in parentheses)

| Types of Transfer | Transfers Into the household | | Transfers Out of the household | |
|-------------------|---------------------------------|------------------------------------|---------------------------------|------------------------------------|
| | Average size of transfer (1) | Average over all households (2) | Average size of transfer (3) | Average over all households (4) |
| Money | \$639 (230) | \$128 (1181) | \$382 (392) | \$131 (1181) |
| Goods | \$136 (130) | \$15 (1181) | \$93 (165) | \$13 (1181) |
| Time | \$342 (310) | \$90 (1181) | \$227 (529) | \$102 (1181) |
| Totals | | \$233 (1181) | | \$246 (1181) |

This is reflected in the close similarity of the figures in columns (2) and (4) of the table. Since questions about transfers-in and transfers-out were asked in different parts of the interview, there is no reason to expect similar totals; indeed, the volume of transfers-in differs greatly from the volume of transfers-out for many individual households.

Although the amounts of these informal transfers in Table 2 may appear too small to be of practical significance for research, policy, or the families themselves, Table 3 demonstrates that the opposite is the case. It shows total value of transfers as a proportion of household income excluding transfers, both measured in the same calendar year.[7] The numerator of this ratio is the absolute sum of transfers-in and transfers-out; it indicates the extent of network usage.

Table 3

TOTAL NETWORK TRANSFERS (INCOMING PLUS OUTGOING) AS PROPORTION
OF HOUSEHOLD INCOME (EXCLUDING TRANSFERS)
(In Malaysian dollars)

| Item | Household Income Excluding Network Transfers | | | | | |
|---------------------------------------|--|-------------------|-------------------|---------------------|-----------------------|-------------------|
| | Less than \$1500 | \$1500- \$3000 | \$3000- \$6000 | \$6000- \$10,000 | \$10,000- \$30,000 | Above \$30,000 |
| Total transfers ÷ household income | .859 | .161 | .121 | .100 | .035 | .010 |
| No. of households | 228 | 230 | 227 | 161 | 200 | 98 |

[7] This income measure was calculated by Kusnic and DaVanzo (1982). It includes the value of agricultural and cottage industry

Twenty percent of the sample households had annual incomes in 1976-1977 of less than 1500 Malaysian dollars. The first column of Table 3 reveals that, on average, these families used exchange networks to transfer resources valued at more than 85 percent of their annual income! This proportion falls dramatically in the next-highest income group, and continues declining to a level of only one percent for households with income above 30,000 Malaysian dollars. Ignoring these informal transfers-- either in research or in policy formulation--could clearly affect the scientific or practical outcomes.[8]

Table 4 describes aggregate transfers by ethnicity and household structure, two characteristics of principal interest in this paper. Columns 4 and 8 show average dollar values of total transfers-in and -out, respectively, for the categories of households described at the left of the table. Columns 9 and 10 show total and net transfers. The first indicates the extent of network usage while the second constitutes net income from transfers. Average household income appears in Column 11.

production consumed at home as well as imputed value of housing services. It excludes value of other home production and of leisure time. Thirty-seven households were dropped from Table 3 because of missing income data.

[8]Kusnic and DaVanzo (1982) account for these transfers in describing the personal distribution of income in Malaysia. Few other analyses of income distribution in less developed countries were able to include such transfers; for example, see Anand (1981). Even Swift (1964), who explicitly examined "Capital, Saving, and Credit in a Malay Peasant Economy," failed to mention interhousehold transfers, much less document them. At the national level, the ratio of savings to GNP, as measured in national income statistics, was about 25 percent in Malaysia in 1974 to 1976 (Young et al., 1980). One wonders whether this exceptionally high ratio would fall or rise still higher if interhousehold transfers were properly included.

TABLE 4
HOUSEHOLD INCOME AND MEASURES OF
NETWORK USAGE, BY ETHNICITY AND HOUSEHOLD STRUCTURE
(Malaysian Dollars)

[illegible]

Column 12 shows that most households in the sample--74 percent for Malays and 59 percent for Chinese--have nuclear structure. Vertically extended households--those containing at least one parent, grandparent, grandchild, or great-grandchild of the nuclear family heads--are next most common. Fully extended households, which contain both vertically and laterally related persons, are next. The least common structure for both ethnic groups is pure lateral extension, in which only a brother, sister, cousin, aunt, uncle, or members of their families live in the household.[9]

In general, one would expect the number of living persons laterally related to a nuclear family to be much greater than the number vertically related. Nevertheless, vertically extended families are more than twice as common, particularly among the Chinese. Most of these households in both ethnic groups contain, in fact, parents of adult members of the household.

Looking at Column 11 of Table 4, average household income for both ethnic groups is lowest in nuclear households and successively higher in vertically, laterally, and fully extended households. These differences are much less among Malay households, with mean income of fully extended households being 2.1 times that of nuclear households, compared with a ratio of 3.3 for Chinese. The biggest income difference for Malays is between nuclear households and extended ones of any type. For Chinese, on the other hand, the income gap widens with extension.[10] Fully

[9] These proportions surprise us. Most general sources (for example, Henderson et al., 1970, pp. 119-142) attest that most Chinese households, and even more Malay households, are vertically extended. However, we do not find other numerical data for comparison, and we have no reason to suspect the MFLS data. They are highly reliable in most instances where comparisons with external sources are possible (Haaga, 1982).

[10] Is it the case that the extended members add to household

extended Chinese households have exceedingly high average income, relative to every other household type.

Turning now to the transfer data in Table 4, the Chinese totals in Column 9 show nuclear households participating much more heavily in exchange networks than do extended households. This pattern could result from the fact that these data document transfers among persons only when they live in different households. If these persons were to move into the same household, this would reduce the transfers measured in these data, but not necessarily change actual transfers among persons. In this case, the data would measure interhousehold transfers, but would not accurately reflect differences in interpersonal transfers. On the other hand, extended households, being generally larger, contain more persons with whom transfers with outsiders could occur. This effect might dominate among Malays, whose nuclear households show less network usage than laterally and fully extended households. Finally, it may be that the presence of relatives alters the exchange network participation of nuclear family members, allowing each to specialize according to different abilities and preferences, as the division of labor in the household increases. These three possibilities cannot be distinguished in such aggregated data; we return to them below in analyzing the microstructure of these interhousehold exchange networks.

income or that households with higher income attract or can afford more members? To the extent that laterally extended members are at higher-earning ages than vertically extended members, the fact in Table 4 that laterally extended households have higher income than vertically extended ones is consistent with the first hypothesis, but does not rule out the second. Part, but not nearly all, of the differences between Malay and Chinese incomes are due to the larger size of Chinese households (see Kusnic and DaVanzo, 1982).

Note also that laterally extended households have extremely low transfers-in (column 4), but high transfers-out (column 8), relative to the other household types. Vertically extended households present the opposite pattern. Especially salient are the very low money transfers into laterally extended households (column 1). These patterns are true of both Malays and Chinese, and indicate that laterally extended households are large net exporters of interhousehold transfers, while vertically extended households are net importers. Are these differences due simply to differential transfer behavior between vertically and laterally linked relatives, or rather to broader differences between the two types of households? We turn to this question in the blockmodel analyses below.

Table 5 presents the same information as Table 4, but by ruralness of the household's residence. It is evident here again, in Column 11, that Malay households have both lower average incomes and lower income variance than Chinese households. For both groups, households living in one of the three metropolitan areas--Kuala Lumpur, Ipoh, and Penang--experience negative net transfers, on average (Column 10). Households in other urban areas receive positive net transfers, and net transfers of rural households are negligible. The blockmodeling analyses to follow will address the specific differences that give rise to these patterns.

Note finally in Table 5 that rural-urban differences in total transfers (Column 9) are exactly the opposite for Malays and Chinese. Malays living in market centers make the most use of these transfer networks, while those living in rural areas make the least use. Chinese

Table 5

HOUSEHOLD INCOME AND MEASURES OF
NETWORK USAGE, BY ETHNICITY AND RURALNESS
(Malaysian Dollars)

| Ethnicity and Ruralness | Transfers In | | | Transfers Out | | | Total Transfers (4) + (8) (9) | Net Transfers (4) - (8) (10) | Household Income (11) | Number of Households (12) | |
|-------------------------|--------------|-----------|----------|---------------|-----------|----------|-------------------------------|------------------------------|-----------------------|---------------------------|-----|
| | Money (1) | Goods (2) | Time (3) | Money (5) | Goods (6) | Time (7) | | | | | |
| | Total (4) | Total (8) | | | | | | | | | |
| Malay: | | | | | | | | | | | |
| Market Center | 55 | 1 | 105 | 146 | 23 | 119 | 288 | 449 | -127 | 7,110 | 51 |
| Other Urban | 180 | 10 | 73 | 263 | 9 | 41 | 170 | 433 | 93 | 8,535 | 87 |
| Rural | 92 | 7 | 45 | 144 | 36 | 112 | 157 | 301 | -13 | 5,276 | 403 |
| Chinese: | | | | | | | | | | | |
| Market Center | 88 | 13 | 71 | 172 | 16 | 173 | 362 | 534 | -190 | 36,197 | 129 |
| Other Urban | 185 | 15 | 198 | 398 | 24 | 84 | 228 | 626 | 170 | 21,363 | 138 |
| Rural | 253 | 24 | 93 | 370 | 366 | 10 | 46 | 422 | -52 | 20,562 | 184 |

households, on the other hand, have much higher transfers when they are rural than when they are metropolitan. Hence, network transfers as a proportion of household income are much less for metropolitan Chinese than for rural Chinese.

IV. DATA TRANSFORMATION AND CLUSTERING

As described above, the basic data for this analysis comprise, for each household in the sample, six matrices of dimensions 20 by 8. There are six types of transfers in and out. The matrix for each contains 160 elements, one for each of the pairwise combinations of transfers between types of household members and outside actors. These elements indicate the amounts of resources transferred through informal networks. These amounts depend both on the networks available to be used and on the degree of use of the available networks. For some purposes, including the aggregate descriptions presented above, the actual amounts of transfers are the appropriate measures. For other purposes, including the following analyses of microstructures, it is more informative to inspect the degree to which different households make use of available networks, controlling for differences in the availabilities of the networks.

Consider, for example, a particular household's matrix for money transfers-out. Say that this matrix contains a zero in the ij^{th} position, despite the fact that intrahousehold category i and extrahousehold category j both contain many members. Now, suppose that a position defined by a different row and column of this matrix also

contains a zero, but that either the intrahousehold category or the extrahousehold category corresponding to this position contains no individuals. In the first instance, the hypothetical zero says a great deal about network transfers: Actors presumably able to consummate transfers are present both inside and outside the household, yet no transfers occur for reasons that need to be explored. In the second instance, the hypothetical zero is uninteresting: No transfers occur because either potential donors or recipients are absent for this household in the sample. Moreover, this distinction is not peculiar to zero elements. In general, a large (small) matrix element in a position corresponding to categories containing few (many) members means that the bond between these categories is strong (weak). In each case, the data reveal a great deal about network usage. Conversely, a large (small) element in a position corresponding to categories with many (few) members says less, since it contains less information about bond strength.

To unravel this confounding of effects, we have rescaled the elements of our transfer matrices to reflect the relationship between actual and potential network usage, rather than raw dollar transfers. (An extensive discussion of our procedure along with its caveats can be found in Butz and Stan (1982a)).

The analysis focuses on these 84 rescaled transfer matrices. Altogether, there are six matrices (money, goods, and time; transfers in and out) for each of six ethnic-ruralness groups (Malay and Chinese; metropolitan, other urban, and rural) and eight ethnic-household structure groups (Malay and Chinese; nuclear, vertical, lateral, fully extended). Each matrix contains information on the microstructure of

exchanges of some particular kind for some type of household. We would like to expose this structure explicitly, showing which intrahousehold categories are similar to each other by virtue of their participation in similar transfers with the same extrahousehold categories. Likewise, we wish to determine which extrahousehold categories are similar to each other through their participation in like transfers with the same in-household categories. To address these questions, we employ a top-down hierarchical clustering algorithm called CONCOR, devised by Harrison C. White and his colleagues.[11]

The primary attraction of this algorithm from our standpoint is the ease with which it handles multiple types of tie. For example, the 20 categories of household members in each of our 84 matrices can be viewed as sending three types of tie, in the form of money, goods, and time transfers, to the eight categories of outside acquaintances. Suppose that we wish to group the 20 intrahousehold categories by the similarity of their transfer patterns across all types of tie. In other words, we will call two inside categories similar when family members in the categories tend to transfer the same monetary amounts to the same outside categories over all types of tie. CONCOR approaches the problem of determining these similarities by first constructing a matrix that represents network usage across the three types of tie. It then groups intrahousehold (and extrahousehold) categories in this matrix, essentially in order to minimize within-group variance and maximize between-group variance.

[11] The most recent and best overview of the relationship between CONCOR and quantitative social network analysis is Arabie, Boorman, and Levitt (1978); technical references on the nature of CONCOR are Breiger, Boorman, and Arabie (1975) and Schwartz (1977); applied work includes White, Boorman, and Breiger (1976), Boorman and White (1976), and Breiger (1976, 1977).

The result of applying this technique is a "blocking" of the data matrices into differentially sparse submatrices. Blocked matrices of this type distill a great deal of information into relatively compact form. The data can be still further compacted, however, by assigning to each submatrix ("block") a scalar score that designates the level of network usage within the block. We have assigned such scores of 0, 1, or 2 to the blocks comprising the 84 data matrices according to low, medium, or high network usage. (An elaboration of block density cutoffs and their methods of determination is found in Butz and Stan (1982a)). We now proceed to describe the clustered data.

V. COMPARISONS OF MALAY AND CHINESE HOUSEHOLDS BY RURALNESS

In examining and comparing these microstructures of exchange, we will focus on several aspects. One is the composition of the blocks. Do the people whom CONCOR has placed together have apparent similarities apart from their patterns of network usage? Are they of the same sex, similar age, or similar relationship to the head of household? If not, what in the cultural, economic, or social context could account for their apparent similarity in this one dimension? A second aspect is the patterns of network usage for a particular set of households. What are the transfer relationships between parents and children, or between household members and relatives versus nonrelatives outside? Do these occur through money, goods, time, or a combination? Finally, we will compare these aspects of the blockmodels across groups. How do the microstructures differ between Chinese and Malays, between rural and

metropolitan households? Rather than present all the blockmodels that give rise to these comparisons, we present two (Tables 6 and 7) for illustrative purposes and summarize the rest. All the blockmodels are shown in Butz and Stan (1982a).

For most of the groups produced by CONCOR, wives of similar ages tend to be blocked together, and the same for husbands. It would be disconcerting to see a more capricious partitioning, aggregating, for example, husbands 20 to 24 and 35 to 39 into the same block with wives older than 45. This does not often occur, giving us initial confidence that the CONCOR algorithm can produce sensible patterns from these data.

Husbands and wives are sometimes blocked separately and sometimes together. Where together, they are invariably in the same age range. Although all husbands or all wives are occasionally blocked together, a split most commonly occurs in the age range from 30 to 40. This suggests that the participation of younger family heads in exchange networks may be fundamentally different from the participation of middle-aged and older heads. Parents of the heads, when they live in the household, tend to be blocked along with the oldest heads in our sample, those older than 40 to 45; they also tend to be blocked with the older head of the same sex. Grandparents of heads are also blocked along with these other older household heads. Hence, there is no suggestion in general that the elderly in our sample exhibit different exchange patterns from the middle-aged. Instead, the single watershed in the life-cycle seems to occur during the thirties or early forties.

This watershed clearly reflects a change in the direction of transfers with children, as well as a change in living patterns. The children of younger couples usually still live at home, where transfers

Table 6

MALAY MONEY TRANSFERS BY DEGREE OF RURALNESS

| | <u>Transfers In</u> | | | | <u>Transfers Out</u> | | | |
|--|---------------------------|--|---|-------------------|--|--|--|---|
| | <u>Metropolitan</u> | | | | | | | |
| | Children | Friends; other relatives; other nonrelatives | Siblings, nieces, nephews; wife's parents | Husband's parents | Children; cousins, aunts, uncles | Other nonrelatives | Wife's parents; other relatives; friends | Husband's parents; siblings, nieces, nephews |
| Residual block | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Residual block |
| Residual block | 0 | 0 | 0 | 0 | 0 | 0 | 2 | Wives 20-24, 35-44 |
| Wives <45 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | Wives 30-34, >44; wife's parents; grandparents; children, other rels. |
| | | | | | 0 | 0 | 0 | 2 Husbands >19; wives 25-29 |
| | | | | | | | | |
| <u>Other Urban</u> | | | | | | | | |
| | Children; other relatives | Other nonrelatives | Parents; cousins, aunts, uncles; friends | | Children; cousins, aunts, uncles; friends; other relatives | Siblings, nieces, nephews; wife's parents | Husband's parents | |
| Residual block | 0 | 0 | 0 | | 0 | 0 | 0 | Residual block |
| Husbands 30-39; husband's father; wife's mother; children, other rels. | 0 | 1 | 0 | | 0 | 0 | 0 | Residual block |
| Wives <40 | 0 | 0 | 0 | | 0 | 0 | 0 | Residual block |
| Husbands >39; wives >39; husband's father | 2 | 0 | 0 | | 1 | 2 | 1 | 2 Husbands >19 |
| | | | | | 0 | 1 | 2 | 0 Wives >19 |
| | | | | | | | | |
| <u>Rural</u> | | | | | | | | |
| | Children | Parents | Other rels; friends; other nonrels. | | Children | Parents; siblings, nieces, nephews; cousins, aunts, uncles; friends; other relatives | | |
| Husbands <30; husband's and wife's fathers | 0 | 0 | 0 | | 0 | 2 | 0 | 1 Husbands <35; wives <35 |
| Children, other relatives; grandparents | 0 | 0 | 1 | | 1 | 2 | 0 | 1 Husbands 35-44 |
| Wives <35; husbands 30-34 | 0 | 0 | 0 | | 2 | 0 | 0 | 1 Husbands >34; children |
| Husbands >34; wives >34; husband's and wife's mothers | 2 | 0 | 1 | | 0 | 1 | 0 | 0 Wives >39; wife's mother |
| | | | | | 0 | 0 | 1 | 0 Wives 35-39; husband's parents; wife's father; grandparents |

with their parents are not documented in these data. More mature households have lost their children, and the interhousehold exchanges emerge clearly. Older family heads are almost always blocked together for transfers-in, and most of their receipts are from their children. Correspondingly, children living outside the household constitute their own block in half of the twelve sets of blockmodels we constructed. In the others, they are usually grouped with other relatives. Compared with the other categories of outside actors, which are blocked in various different combinations, children exhibit quite distinctive transfer patterns. No differential pattern of transfers from children outside the household by sex of family head emerges. Transfers from children to their parents aged 30 to 50 are most prominently money and secondarily in the form of time. For Malays, these transfers are most important in rural households and least important in metropolitan households, a pattern discussed further below.

The transfer-out blockmodels display another dimension of parent-child transfers: between family heads and their parents, as well as between family heads and their children. In most cases, the former transfers are more substantial than the latter, representing, at this middle stage in the life cycle, stronger forward than backward intergenerational transfers. These couples both give to and receive from their children when living apart, though the receipts are usually more prominent. Meanwhile, they are giving to their own parents.

These transfers to their parents commonly consist broadly of money, goods, and time, and come not only from family heads aged 30 to 50, but from younger heads as well. In fact, the split between younger and

older family heads, which is so prominent in the blocks for transfers-in, hardly occurs for transfers out. Instead, husbands and wives usually appear in separate blocks. For three of the six blockmodels, the reason is evident: Wife's and husband's parents living outside are in separate blocks and receive transfers predominantly from their own children. The most extreme differentiation occurs among Chinese households in other-urban areas, whose female heads transfer money, goods, and time to their own parents and only time to their husbands' parents, while the husbands transfer all three resources to their own parents, but only relatively small amounts of money to their in-laws.

Overall, it appears that Malay and Chinese adults, whether they live in rural, urban, or metropolitan areas, support their elderly parents. Likewise, middle-aged Chinese adults are consistently supported by their children. Middle-aged Malay adults, however, are not. Their transfers-in from children are strong in rural areas, weaken slightly in other-urban settings, and virtually disappear in metropolitan areas (the weakening in other-urban settings occurs in goods and time, not shown in Table 6). The receipts consist broadly of money, goods, and time for rural Malays, but only of relatively small amounts of money for metropolitan Malays, as suggested in Table 6. These parents seem, then, to be experiencing the phenomenon emphasized by Caldwell (1976): They support their own parents, but are losing the support of their children. This generation of urban Malays may be the one caught in the middle of the transition to nuclear families.

The complementary tendency that Caldwell expects, for parents to begin transferring more resources to their children, is not in evidence here. On the contrary, middle-aged rural parents of both races transfer

more to their children than do their urban contemporaries. In most cases, time transfers predominate but the opposite flows--from children to their parents--are more often money. This same pattern is in evidence for the previous generational link. Transfers from parents outside the household to their adult children consist predominantly of time and goods. These are less important in every case than the opposite transfers, from adult children to their parents. Finally, we note that fertility rates have been falling more rapidly among the urban Chinese than among the urban Malays in the last decade. Although these data cannot elucidate trends, there is nothing in these cross-sectional comparisons to suggest that family nucleation is proceeding more rapidly among the Chinese; quite the contrary. Hence, Caldwell's hypothesis would predict that urban Malay fertility may be poised to decline; but it seems unable to illuminate, in conjunction with these data, why Chinese fertility is already falling.

In general, households that make heavy use of exchange networks do so across the board; and households that use them lightly do not concentrate particularly on one type of giver or recipient, as would be evident if a particular row or column in a blockmodel were filled to the exclusion of the others. Rural households make the most use of these networks and metropolitan households the least use, as we might expect because of potentially different capital market access, but considerable diversity exists within this regularity.

VI. COMPARISONS BY TYPE OF HOUSEHOLD STRUCTURE

As in the blockmodels described above, older husbands and wives are nearly always blocked together for transfers-in, but almost never for

transfers-out. This indicates that they tend to receive transfers of the same types, in the same amounts, and from the same sources. However, they differ significantly in these respects in their patterns of transferring to outsiders. This structure weakens considerably in fully extended households, however, and fails completely for the Chinese.

For both ethnic groups, nuclear and laterally extended households are somewhat similar with respect to their transfer structures, and vertically and fully extended households are somewhat similar, but the two pairs are quite dissimilar in important respects. In particular, nuclear and laterally extended households exhibit structures that are considerably more interpretable than are the other two. The blockmodels for fully extended households group categories that appear on other criteria to have little to do with each other. Though less extreme, vertically extended households also exhibit less interpretable structures than do the other two. The meaning of such lack of block interpretability is not completely clear. In general, though, it is associated with less usage of the networks: Types of households that use networks least tend to exhibit less meaningful blocking of participants.

In this case, a probable reason for the difference lies with the degree to which different types of relatives substitute for transfers by nuclear family members. In Sec. III above, we raised the question of why different household structures yield different amounts of total network activity. Is it simply because the particular persons included or excluded from the household conduct transfers that are respectively included or excluded from the totals? Or, more broadly, is the presence or absence of particular types of persons also associated with

MALAY MONEY TRANSFERS BY TYPE OF HOUSEHOLD STRUCTURE

| | <u>Transfers In</u> | | | | <u>Transfers Out</u> | | | | |
|--|---|----------------------------------|---|--|-----------------------------|--|---------------------------|--|--|
| | <u>Nuclear</u> | | | | | | | | |
| | Children | Other nonrelatives | Wife's parents; siblings, nieces, nephews | Husband's parents; other rels; friends | Children | Parents | Other relatives; friends | Cousins, aunts, uncles; other nonrels. | |
| Residual block | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | Wives; grandparents; children, other relatives |
| Husb. 25-34; children, other relatives; grandparents | 0 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | Husbands > 19 |
| Wives <35; husbands 20-24 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | Residual block |
| Wives >34; husbands >34 | 2 | 1 | 2 | 1 | | | | | |
| | <u>Laterally Extended</u> | | | | | | | | |
| | Children; wife's parents; other rels; friends; other nonrels. | Husband's parents; aunts, uncles | Siblings, nieces, nephews | | Children; husband's parents | Wife's parents | Other rels. | Other nonrels. | |
| Residual block | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | Residual block |
| Husbands 20-24, 35-39; wives 40-44 | 0 | 0 | 0 | | 1 | 0 | 0 | 1 | Husbands 20-24, >35 |
| Wives <35 | 0 | 0 | 0 | | 0 | 1 | 0 | 0 | Wives 30-34, >44; husbands 30-34 |
| | | | | | 0 | 2 | 1 | 0 | Wives 20-44; husbands 25-29 |
| | | | | | 0 | 0 | 0 | 0 | Residual block |
| | <u>Vertically Extended</u> | | | | | | | | |
| | Children | Residual Block | Residual Block | | Children; wife's parents | Husband's parents; other rels; friends; other nonrels. | Siblings, nieces, nephews | | |
| Husbands <20, 25-39; wife's father | 0 | 0 | 0 | | 0 | 0 | 0 | | Residual block |
| Residual block | 0 | 0 | 0 | | 2 | 0 | 0 | | Husbands <25; children, other relatives |
| Wives >34; husbands >39 | 2 | 0 | 0 | | 0 | 0 | 0 | | Wives; husband's and wife's mothers |
| Husband's mother | 1 | 0 | 0 | | | | | | |
| | <u>Fully Extended</u> | | | | | | | | |
| | Children | Other rels. | Residual Block | Residual Block | Children; friends | Other rels; other nonrels. | Parents | Siblings, nieces, nephews | |
| Residual block | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | Husbands <20, 25-29; wives 20-24; husband's father; grandparents |
| Wives 40-44; wife's and husband's mothers | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Wives 40-44; husband's parents |
| Residual block | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | Husbands 20-24; 30-39; wives 25-34; wife's mother |
| | | | | | 0 | 0 | 0 | 0 | Husbands >39; wives 35-39, >44; children, other relatives |

differences in the network activities of other household members? Comparing nuclear and vertically extended Malay households indicates the general answer. Parents of household heads transfer heavily with the nuclear family when they live apart. Once inside, however, these parents virtually drop out of the network because most of their transferring is with their children and becomes intrahousehold exchange in vertically extended households. What is interesting is that much of the rest of the network also vanishes in these households, as suggested in Table 7. Two hypotheses might explain this behavior. First, the presence of vertically related persons, primarily older parents, may substitute very broadly for the interhousehold exchanges that nuclear households make. Alternatively, the absorption of vertically related persons into the household might cause the household simply to take less cognizance of informal networks. In either case, these data suggest that a great deal of observed network usage in toto can be explained by the household location of vertically related family members.

The same network relationships hold, though less dramatically, for Chinese households. It is not nearly so evident, however, in comparisons between nuclear and laterally extended households. Laterally related persons do not so completely take the place of the nuclear family's extra-household transfers. This difference probably accounts for the fact that nuclear and laterally extended households have fuller, more interpretable, blockmodels than do vertically and fully extended households.

Moving to another contrast, time transfers (not shown in Table 7) for Malays remain relatively strong regardless of household structure, but transfers of money and goods are considerably less in extended households of any type. In contrast, money and goods transfers are not robust across types of structure for Chinese households, while time transfers are considerably less in extended households. These patterns suggest that household members who are not part of the nuclear family tend to exchange money and goods with nuclear family members in the case of Malay households. In Chinese households, this exchange consists predominantly of time.

Two contrasts stand out in comparing the two extreme structures, nuclear and fully extended households. One is the radically different importance of transfers-in from children. These transfers are much greater in nuclear households of both ethnic groups. Since presence of children is not a criterion for differentiating the four types of structure, it appears that these transfers and the presence of other relatives in the household are substitutes: There are considerably more transfers to households that contain no other relatives that could help instead. The other contrast concerns transfers to mothers of family heads. For Malays, these exist in some situations but not others; but for Chinese, these older mothers do well wherever they are located and regardless of household structure. When living in fully extended households, they receive transfers from children, other relatives, and friends living outside, while their husbands in the household receive virtually nothing. When living apart from the nuclear family, parents of the Chinese household heads receive transfers from almost everyone in

the household. The data do not distinguish between mothers and fathers when they live outside the household, but it may be the mothers who benefit the most in this case as well.

Another interesting comparison is between nuclear and laterally extended Malay households. The latter transfer much less money and fewer goods than the former, but except for children, most outside participants still transfer time in. This comes almost entirely to the wife, whereas husbands also receive substantial time transfers in nuclear households. This dual concentration on time transfers-in and on wives as recipients in laterally extended households suggests that the added relatives in these households substitute for the interhousehold transfers of money and goods of all members of nuclear households, and for the time transfers of husbands in those households. These relatives do not take the place of the wives' time transfers.

VII. CONCLUSIONS

Informal transactions through interhousehold exchange networks are significant, relative to household incomes, in Malaysia. For poor households, these transfers are indeed substantial. Most of the transfers are monetary, but a sizable quantity consists of various kinds of help. Transfers of goods are considerably less important. The empirical literature on aggregate savings functions in less developed countries ignores these transfers (Mikesell and Zinser, 1973; Lipton, 1978). So do most studies of income distribution (Kusnic and DaVanzo (1982) is an exception).

The CONCOR algorithm, originally devised to elucidate the structures of closed social networks, produces blockmodels from these data that are generally interpretable. These blockmodels group together types of network participants whose participation patterns are similar. Breaking the sample down by ethnicity, ruralness of community, and type of household structure, CONCOR reveals microstructures of exchange networks that vary considerably in the importance of particular household members, outside acquaintances, and exchanges of money, goods, and time.

The attempt to document informal transfers in a national probability sample was quite new in the Malaysian Family Life Survey. Subsequent survey efforts can benefit from this experience in several ways:

First, the questionnaire forced respondents to identify every transfer with a particular pair of household member and outside actor, even though some transfers were undoubtedly to or from the household in general. After all, if the husband grows the wheat, the son mills it, the wife cooks the bread, and the daughter carries it down the street to her grandmother, who is doing the transferring? What would an MFLS respondent reply in this case? Perhaps "the daughter." We cannot know how many such arbitrary assignments the respondents made. Future surveys should address this ambiguity directly.

Second, the absence of information on intrahousehold transfers limits the applicability of these data to interhousehold transfers. For most analytical purposes, a transfer between two persons conveys the same information whether or not they live in the same household. In the

MFLS, however, the transfer appears only if they do not. We have attempted to correct for this rather arbitrary criterion by adjusting the transfer data for the numbers and types of household members. However, without knowing the numbers of relatives and friends living outside the household who are eligible to transfer with the household, it is impossible to distinguish the network channels that are usable from the others that simply do not exist. Future surveys of informal transfers should document transfers within the household and should identify extrahousehold persons who might participate in transfers to or from household members.

In spite of these deficiencies, the interhousehold transfer data from the MFLS evidence sensible patterns, both in the aggregate and in underlying characteristics. The ability to examine transfer-related phenomena in alternative slices through a national sample may compensate for the loss of descriptive depth, and probably of data reliability, that results from leaving the more comfortable domain of the intensive village study.

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