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Tradeoffs between Public and Private Economic Support of the Elderly: Results from a Natural Experiment in Taiwan

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Organizations collaborating in this research include: Population Studies and Training Center, Brown University; Population Institute, University of the Philippines; Department of Social Work and Psychology, National University of Singapore; Taiwan Provincial Institute of Family Planning; and Institute of Population Studies, Chulalongkorn University. For additional information about the comparative project, please contact the Principal Investigator: Albert I. Hermalin, Population Studies Center, University of Michigan, PO Box 1248, Ann Arbor MI 48106-1248 USA.

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**Tradeoffs between Public and Private Economic Support of the Elderly:
Results from a Natural Experiment in Taiwan**

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Tradeoffs between Public and Private Economic Support of the Elderly: Results from a Natural Experiment in Taiwan

Abstract

The purpose of this study is to examine how public money transfers affect private money transfers. Analyses draw on a natural experiment in Taiwan, where two subsidy programs for the elderly were implemented in 1994-1995. One program targeted farmers age 65 years and older throughout Taiwan. The other subsidy program was tied to political elections and implemented in 5 of the survey hsiens (counties) and cities. Nationally representative, longitudinal data from 1989-1996 on approximately 4,000 older persons are used to examine how private transfers vary with receipt of public transfers and whether the subsidy programs had an impact on reliance on family for major financial support. Private transfers have been the major source of income for the elderly in Taiwan, but a dramatic shift occurred in the mid-1990s towards pension income, even among those elderly who had previously relied on family financial support. Multivariate results indicate that the farmers pension program had a significant and positive effect on the likelihood that older persons switched from private transfers as their main source of income in 1993 to pension income in 1996. In contrast, the hsien and city-level subsidy program had little effect on the move away from private transfer income as a main source of support.

Datasets used:

Survey of Health and Living Status of the Elderly: Taiwan, 1989, 1993, 1995 and 1996

Introduction

This paper examines how public money transfers affect private money transfers, a relationship that is at the core of questions about the effectiveness of public redistribution programs. Given growing concerns about the solvency of public support programs for the elderly as well as the consequences of program change for those who are most economically vulnerable, it becomes critical to gain a better understanding of the link between public and private transfers to the elderly.

The literature on public-private tradeoffs has been growing in the United States (Holtz-Eakin and Smeeding 1994; Schoeni 1992, 1997) and Europe (Ward-Batts 2000) as data become available to test hypotheses about the impact of social welfare programs. This study takes advantage of a natural experiment in Taiwan to examine in an Asian setting some of the substantive arguments in the Western literature about public-private tradeoffs. Support in old age from family members, primarily children, is the norm in Taiwan. As a consequence, changes in other types of income that older persons receive may contribute to a decline in reliance of the elderly on their children and other family members. The results from this study will be valuable not only for Taiwan, as policymakers continue to formulate a public pension system for the nation, but also for other countries that are either contemplating such systems or need to make changes in existing systems.

One motivation for this study was empirical in nature. In separate work documenting the economic status of the elderly in Taiwan (Hermalin, Roan and Chang 1999), an unexpected switch in major income sources over time was observed. Of those elderly receiving primary financial support from children in 1989, only 54 percent of this cohort continued to receive their primary support from children in 1996 and nearly one-third had shifted to pension or retirement fund as their major source of income. While it is to be expected that a proportion of the elderly would retire and begin receiving pensions, the change observed appeared too large to be explained solely by retirement pensions. During this time period, two subsidy programs began in Taiwan that could have accounted for the observed switch in the major income sources of the elderly. The policy changes represent a “natural experiment” with which to examine how reliance on private support is affected, if at all, by the public transfers.

This paper examines two main research questions using longitudinal survey data. First, how do the major sources of income of the elderly change over time? Second, have the two subsidy programs affected reliance on private transfers as a major source of income among the elderly? The paper begins with a discussion of how financial sources of support of the elderly might shift over time and the main substantive arguments about public-private tradeoffs in the literature. Key details of the Taiwanese subsidy programs that constitute the “natural experiment” of this study are then presented. Following description of the data and measures, results are presented on descriptive changes in the major sources of income of the elderly and the multivariate analyses of income change.

Background

In the absence of major policy shifts in old-age support provision, older people are likely to become more financially dependent on family over time as they deplete their own financial resources (e.g., earnings, lump-sum pensions or savings). In Taiwan, the preliminary evidence indicates that this pattern changed abruptly in the mid-1990s, with a shift away from reliance on private transfers and toward greater reliance on pensions. Logically this observed shift could be due to one or more of the following factors: (1) Older people who put aside their lump sum pensions or other savings and started to draw on these, perhaps in response to changing circumstances of their children or other private providers; (2) New sources of retirement funds like new pension or subsidy schemes; or (3) A methodological artifact arising from the manner in which the data were collected over time.

The U.S. literature provides a solid guide to how private transfer behavior might react to public support alternatives. Four economic models of private transfer behavior predominate the literature: altruism, warm glow, exchange and insurance (Holtz-Eakin and Smeeding 1994; see Schoeni 1997 for a review of evidence; Soldo and Hill 1993). What follows are very brief synopses of each model and the expected effect on public-private income tradeoffs for the elderly. The altruism model assumes that private transfers are made to those in relative need. If private transfers are made for altruistic reasons, we would expect to see—in a simplified version of the world—a dollar-for-dollar tradeoff between an older person's receipt of public transfer income and private transfer income. The warm glow model assumes that the people who give money derive personal satisfaction from doing so regardless of the level of need of the recipient, and so there should be no tradeoff between an older person's receipt of public income and private transfer income. The exchange model of transfers, as its name implies, assumes that people provide money (or time) in return for something else. Unfortunately, no explicit directional effect of public and private transfers follows from the exchange model. Lastly, the insurance model of private transfers posits that such transfers are made when recipients experience a drop in financial resources or are unable to finance a substantial investment (e.g., buying a home). As in the case of the altruism model, one would generally expect a drop in an older person's private transfer income with an increase in receipt of public transfer income.

Studies of private-public tradeoffs in the U.S. tend to focus on the impact that the amount of public support income has on the probability of receiving private transfers or on the amount of private transfer income received. In the United States, money transfers flow mainly from parents to children than from children to parents (Soldo and Hill 1993). In Taiwan, flows of financial support from children to elderly parents are much higher. Co-residence of the elderly with adult children, which likely involves financial transfers, has declined slightly in Taiwan from over 80 percent in the 1970s to around 70 percent in the 1990s, but remains quite high (Hermalin 2001; Hermalin, Ofstedal and Chang 1996). In contrast, the predominant living arrangements of older persons in the United States are living with a spouse only (42 percent of those aged 70 years and older) and living alone (36 percent) (Weeks and Ofstedal forthcoming). Financial support from family to older adults is also quite prevalent in Taiwan: In 1996, two-thirds of elderly Taiwanese received income from children or other relatives and just over half reported that other people paid for all or some of their household expenses (Hermalin, Roan and Chang 1999). Given the widespread prevalence of family financial support of older Taiwanese, we would not expect to see a public support program reduce the likelihood of receiving any money from family. Rather, we expect the effect of a public support program to be a sort of "tipping" mechanism that pushes elderly from a primary reliance on family financial support to a primary reliance on non-family support. It is in this respect that we examine whether the public support programs instituted in Taiwan in the 1990s had any impact on the shift in reliance on private transfers to pension income as the main source of income in old age.

Although Taiwan is currently in the process of developing a universal pension system, until recently pensions were available only to a small group of retirees, primarily civil servants and those in certain private sector occupations. Under the Civil Servant Retirement Regulations (CSRR), first implemented in 1943 and amended in 1992, employees can retire when they reach 60 or complete 25 years of service. The mandatory age of retirement is 65. The influx of Mainlanders in 1949-50, their strong role in government service, and the rather generous pension system stirred interest on the part of other workers for retirement benefits. This led to the passage of the Labor Standards Law (LSL) in 1984 (effective in 1985) that governs labor contracts and regulates retirement practices in the private sector. The LSL covers manufacturing and non-manufacturing workers in the private sector but excludes employees in finance, banking, commerce, and service industries. Workers can retire after 25 years of service, or at age 55 with 15 years of service. Pensions are awarded as a lump sum with a 45-month wage equivalent maximum.

Together these programs covered only a small proportion of the current elderly population because many made their living as farmers or in family-run businesses. Indeed, approximately 80 percent of persons age 60 or over in Taiwan in 1989 had no pension income. In the early and mid-1990s, several subsidy programs were initiated in Taiwan to provide income to this segment of the population. The first program established was a social welfare program for elderly in 1993. Legislation provided monthly subsidies of US\$ 120 to elderly in poverty (defined as those 65 or older with monthly income below US\$180 *and* who had no financial support from children).

The second and third programs for the elderly were not means-tested (as the social welfare program was), although individuals were not eligible for the subsidies if they were already receiving a pension. Table 1 shows some of the key details of each of these programs. The farmers pension program began in June 1995. All persons age 65 years and older who were registered farmers and who were not already receiving a pension (such as those for soldiers, teachers or civil servants) or a social welfare payment were eligible for a monthly pension of \$3000 New Taiwan (NT) dollars (or US\$111 in 1995). While the proportion of the labor force engaged in agriculture has been declining over the years, from 36.7 percent in 1970 to 8.3 percent in 1999 (Council for Economic Planning and Development 2000), over one-third of the elderly in the 1996 survey were engaged in farming or had been farmers most of their lives (Hermalin 2001).

Table 1. Characteristics of Taiwan Subsidy Programs for the Elderly Beginning in 1994-1995

Program	Eligibility	Amount and frequency	Duration
Farmers pension program	Farmers and fisherman age 65 years and older who are not already receiving pensions (soldiers, teachers, civil servants) or social welfare for persons in poverty	\$3000 NT every month	June 1995 - present Program operating through present
Hsien and city subsidy programs (1994-1996)	All persons age 65 years and older without any existing pension payment (including farmers pension).	Varied by area	Varied by area
Taipei Hsien	See above	\$5000 NT each month	July 1995 – October 1999 4 months each year from July to October
Yi-Lan Hsien	See above	\$3000 NT each month	July 1995 – present 4 months each year from July to October
Kaoshiung Hsien	See above	\$5000 NT each month	July 1994 – October 1994
Tai-Nan Hsien	See above	\$2000 NT each time	July 1994 – October 1995 Spring Festival senior subsidy
Chya-Yi City	See above	\$5000 NT each month	July 1994 – October 1994

Source: Social Welfare Division, Regional Office in Central Taiwan, Ministry of the Interior (May 17, 2000)

Note: Programs in two hsiens are omitted from this list because the panel data contain only one respondent in each hsien. The hsiens were not part of the original sample design of the 1989 survey—the two panel respondents moved to these hsiens and were followed-up for interview. Taipei City is also omitted from the list because of the lack of overlap between the timing of the program and the time reference for income in the 1996 survey questions.

The hsien (county) and city subsidy program was much more varied than the farmers pension program and began as part of a political platform in the 1993 local government elections. In 1993 mayoral elections in 21 hsiens and cities in Taiwan Province, DPP candidates proposed elderly subsidies as part of their campaign platform. Five DPP candidates won and implemented elderly subsidy programs along with two non-DPP mayors. Taipei city's mayor at the time (now the current President of Taiwan) also implemented an intense yet short-lived elderly subsidy program. The subsidy programs varied across counties and cities by the amount of the subsidy given (ranging from \$2000 NT to \$5000 NT), the frequency that the subsidy was given (periodic to monthly), and the duration of the program (from 4 months only to programs still ongoing). The median annual income in 1995 for persons aged 60 and older (including income from spouses) was \$168000 NT (or US\$ 6363 (\$26.4 NT = US\$ 1 in 1995)) and 34 percent of older persons reported annual incomes of less than \$100000 NT (or US\$ 3788) (Hermalin, Roan and Chang 1999). The farmers pension program provided \$36000 NT per year or 21 percent of the median annual income for elderly. The high subsidy, intensive programs at the county and city-level (e.g., \$5000 NT every month) would have contributed towards a higher proportion of an older person's annual income, but these tended to be short-lived programs.

The government of Taiwan is in the process of starting a new national annuity program. According to the drafts of the plan appearing in the press, the annuity program will give every citizen a maximum monthly pension of US\$ 272 (equivalent to approximately \$86000 NT annually) with a premium deduction set at US\$ 27 a month, or 10 percent of the annuity. The government will subsidize the program by paying 20 to 40 percent of the premium, depending on a worker's occupation. Provision for continuing coverage under existing plans for those currently covered and for switching to the new national program are also included. The results from this study should provide some indication of the possible effects that the new province-wide program may have on private support among the elderly.

Data and Measures

We use nationally representative, longitudinal data from four surveys on 4,049 persons age 60 years and older (at baseline in 1989) to examine the impact that these public transfer programs had on private transfers. The baseline survey is the *1989 Survey of Health and Living Status of the Elderly* (see Hermalin, Liang and Chang 1989 for details). Respondents were re-interviewed in 1993, 1995 and 1996. Data from 1989, 1993 and 1996 surveys contain detailed information on major income sources and financial transfers between the elderly respondent and family members. The *1995 Long-Term Survey of Health and Living Status of the Elderly in Taiwan* administered an abbreviated form of the questionnaire that focused mainly on health. We utilize residence information from the 1995 survey in order to determine eligibility for the hsien and city-level subsidy programs. The 1989, 1993, and 1995 panel data are available for public use (see <http://www.icpsr.umich.edu>).

There are a couple of limitations to the panel data. While the data cover 7 years and contain much detail about a wide range of income types, they do not contain information on amounts of transfers in each wave of survey data. In waves where amounts of income and transfers are obtained, the questions and response categories vary between surveys, thus complicating comparison over time on this dimension. We place more focus, as a result, on respondents' reports of their major source of income. Even this focus may be compromised slightly, however, because major source of income was asked in slightly different ways in the 1989, 1993 and 1996 surveys. In 1989 the question was: "At present, what are the major sources of your (and your spouse's) money income?" If the respondent listed more than one source, a follow-up question was asked: "What is the most important source of income?" In 1993, respondents were asked: "In the past year, what was your most important source of money income?" If the code signified that more than one source was named, we assigned non-private income sources instead of private sources as the major source of income. In the 1996 survey, the respondent was asked, for eight categories of income, whether he/she and his/her spouse (separately) had income of each type. Those respondents indicating

more than one source were then asked to identify their major source and second major source, followed by the total income the respondent or couple received in the prior year. Major sources of income are categorized as work income (including wages, salaries and any income from family businesses or farming), private transfers (from children, other family members, or friends), pension or retirement income, and other income (income from stocks, rental properties, or savings).

The overall sample for analysis is adults age 60 years and older in the 1989 survey. The response rate for the 1989 baseline survey was 91.8 percent. The sample design for the baseline survey in 1989 was a three-stage (townships, blocks and individuals), stratified sample using the Taiwan Household Register system. Details can be found in Hermalin, Liang and Chang (1989).

In 1993, 85.4 percent of the 1989 respondents were still living and interviews were obtained with 91.2 percent. In 1996, over one-quarter of the 1989 baseline respondents had died (26.1 percent) and interviews were completed with 89.2 percent of the remaining sample. Information on death of panel members is obtained through informants at the time of the follow-up interview (1993 and 1996) and from death certificates. Respondents who are lost to follow-up are searched in the death certificates to determine whether they had died since the previous interview.

Table 2. Sample Characteristics of the 1989-1996 Taiwan Surveys of the Elderly

Sample characteristics	Number	Response rate*
1989 survey		
Sample selected	4412	
Interviewed	4049	91.8 %
1993 survey		
Interviewed	3155	91.2%
Not interviewed		
Known deceased	590	
Lost to follow-up	305	
1996 survey		
Interviewed	2669	89.2%
Not interviewed		
Known deceased	466	
Lost to follow-up	324	

* Follow-up response rates presented for the 1993 and 1996 surveys (excluding those who died from the denominator).

We examine the first research question—how the major sources of income change over time—by looking at descriptive data from the 1989, 1993, and 1996 surveys (e.g., proportion of elderly receiving different types of income over time, proportional changes in major sources of income over time).

The second research question—whether the two subsidy programs encouraged a switch from private transfers to pension as a major source of income among the elderly—is addressed through both descriptive and multivariate analysis. For these analyses we focus exclusively on those who relied on private transfers as their major source of income in 1993, and examine the nature and extent of shifts in

major income source by 1996. We are particularly interested in whether the observed shift in major source of income is more pronounced for respondents who received or were eligible to receive subsidies (i.e., farmers and those in hsien and cities with a subsidy program) compared to respondents who were not.

The indicators for program eligibility/participation are mutually exclusive. Respondents (and their spouses) who say their current, last or major occupation was farming or fishing in 1993 are coded as eligible for (and implying that they participated in) the farmers pension program. Hsien and city-level program participation is measured as residence in 1995 in one of the program hsien or cities, current/last/major occupation of respondent (and spouse) was not in farming or fishing in 1993, and respondent (or spouse) did not receive any pension income in 1993.

We further investigate the shift from private to pension income in a multivariate framework by regressing whether pension or government allowances were the major source of income in 1996 (yes/no) on type of program participation (farmer program, ongoing hsien or city-level subsidy, or no program participation). Coresidence with a child in 1996 is added as a control variable in order to differentiate private transfers that might be entangled with intra-household transfers from private transfers that are solely from people outside the household. Since all panel respondents are 67 years or older in 1996, coresidence is almost always with an adult child who one could consider independent (e.g., married, employed, or out of school). The sex of the respondent, mainlander ethnicity, and marital status in 1996 are added to the models as sociodemographic control variables. Average monthly income of the respondent (and spouse) is also included as a control for the respondent's relative economic status in 1993 and as an interaction term with program type. A series of dummy variables are used, adapted from the categorical income variable from the 1993 survey. Program subsidies, which are not large on average, should have most of an impact on movement from private to pension income for those persons at the lower end of the income distribution.

Results

We would expect the proportion of elderly relying on private sources of support to increase as they age. Table 3 shows the overall distribution of major source of income for the elderly 1989-1996. The proportion of older adults citing private transfers as their main source of income increased slightly from 52 percent in 1989 (adults age 60 years and older) to 54 percent in 1993. However, the proportion relying on private transfers dropped substantially to 38 percent in 1996 (among adults age 67 years and older). Similarly, the proportion primarily relying on pension income rose slightly from 15 to 16 percent between 1989 and 1993, and then increased dramatically to 37 percent in 1996. Certainly part of this change is due to pension income from those who retired in the intervening years (e.g., work or business earnings as main income source dropped from 22 percent in 1993 to 14 percent in 1996), however, this pathway cannot account for the full magnitude of the increase in reliance on pension income.

Table 3. Major Source of Income among a Cohort of Older Persons Age 60+ in 1989 as Observed in 1989, 1993 and 1996, Taiwan

Major source of income	1989 (60+ years)	1993 (64+ years)	1996 (67+ years)
Work or family business	28.4	21.6	13.8
Private transfers	52.3	54.1	38.0
Pension or retirement	14.8	15.9	36.8
Other income (rental, stocks, etc.)	4.5	8.4	11.4
Total	100.0	100.0	100.0
Sample size	4049	3155	2669

Table 4 presents changes over time in major source of income depending on the source of income in the base year. The left panel shows changes among panel respondents from 1989 to 1993 and the right panel shows changes from 1993 to 1996. Of particular interest is the change that occurred among those who relied primarily on private transfers as their major source of income. Between 1989 and 1993, 78 percent of these people continued in their reliance on family for financial support. Again, we would expect a high level of continuity of family support as this cohort advances further in old age. However, between 1993 and 1996, approximately half of those initially relying on family support continued to do so in 1996 and fully 29 percent switched to pension or retirement income as their major source of financial support.

Table 4. Changes in Major Source of Income, 1989-1993 and 1993-1996, for Cohort Age 60+ in 1989, Taiwan

1989 Income	1993					1993 Income	1996				
	Work	Private	Pension	Other	Total (n)		Work	Private	Pension	Other	Total (n)
Work	43.9	34.3	15.9	5.9	100.0 (970)	Work	35.2	22.0	33.6	9.3	100.1 (583)
Private	10.7	77.7	3.5	8.1	100.0 (1623)	Private	7.7	54.2	28.6	9.5	100.0 (1348)
Pension	13.7	14.8	64.0	7.5	100.0 (439)	Pension	6.2	10.1	73.5	10.3	100.1 (388)
Other	17.9	39.8	6.5	35.8	100.0 (123)	Other	4.4	32.5	31.6	31.6	100.1 (206)

Table 5 shows changes in major source of income over time by type of public support for the elderly whose major source of income in 1993 was from private transfers (54 percent of all panel respondents in that year). The percentage of those switching from private to pension income is in the first column.

Among farmers, 38 percent switched from private to pension income and only 45 percent continued relying primarily on family. Among the elderly living in the subsidy hsiens and cities (and who were not farmers), 23 percent switched to pension income, and slightly fewer of the elderly who were not in any program (20 percent) switched from private to pension income. These results suggest that the farmers pension program had a substantial effect on private transfers while the hsien and city-level subsidy had a small impact.

Table 5. Percent Changing from Private Transfers in 1993 to Other Main Sources of Income in 1996 by Type of Program Eligibility, among Persons with Private Transfers as Main Source of Income in 1993, Taiwan

Type of Program Eligibility	Private to Pension	Private to private	Private to other	Total	N
Total	28.6	54.2	17.2	100.0	1348
Farmer pension	38.1	44.9	17.0	100.0	609
Non-farmer, hsien and city-level program resident	22.9	64.7	12.4	100.0	170
Non-farmer, not resident in program areas	19.8	61.3	18.9	100.0	532

* Program eligibility is measured as “farmer pension” if in 1993 respondent (or spouse) said his/her current, last or major occupation was farming or fishing. Hsien and city-level program participation is measured as residence in 1995 in one of the program hsiens or cities, current/last/major occupation of respondent (and spouse) was not in farming or fishing, and respondent (or spouse) did not receive any pension income in 1993. Thirty-seven cases contained missing information on relevant variables and were excluded from analysis.

The percentage distribution of adults who received private transfers in 1993 across all independent variables is shown in Table A-1 in the appendix. The logistic regression model results are presented in Table 6 as odds ratios and confidence intervals (95 percent) for the model with program effects only and the full model with sociodemographic and income control variables. The first key result is that the farmer’s pension program had a strong positive and statistically significant effect on the likelihood of moving from reliance on family income to reliance on pension income between 1993 and 1996, compared to other transitions. Second, the hsien and city-level subsidy program shows no evidence of “tipping” older persons away from reliance on family transfers to reliance on pension income. Although the coefficient is in the right direction to support this hypothesis, the effect is not statistically significant. These same program effects remain even in the full model with sociodemographic and income controls.

Table 6. Odds ratios of a Logistic Regression Model of Change from Private to Pension Income versus Private to All Other Sources of Income^a among Adults Age 67 Years and Older, 1993-1996, Taiwan (n = 1311)

Determinants	Program model		Full model	
	Odds ratio	95% CI	Odds ratio	95% CI
Program indicators				
Farmer in 1993	2.49***	1.91, 3.26	2.41***	1.80, 3.21
Non-farmer, subsidy	1.21	0.80, 1.83	1.20	0.78, 1.83
Non-farmer (ref)	1.00		1.00	
Sociodemographic factors				
Age 64 to 69 years in 1993			1.02	0.66, 1.57
Age 70 to 79 years in 1993			1.08	0.71, 1.62
Age 80 years and older (ref)			1.00	
Male			1.11	0.85, 1.44
Female (ref)			1.00	
Married in 1996			1.27	0.97, 1.68
Not married (ref)			1.00	
Mainlander			2.15***	1.27, 3.61
Other ethnicity (ref)			1.00	
Coresidence with child in 1996			0.95	0.71, 1.26
No coresidence (ref)			1.00	
Monthly income in 1993				
Less than \$ 5000 NT			2.75***	1.58, 4.76
\$ 5000 - \$ 19999 NT			1.13	0.65, 1.97
\$ 20000 NT and above (ref)			1.00	
Missing or don't know			0.94	0.24, 3.72
Interaction terms				
Farm93*Income < \$ 5000			1.42	0.82, 2.48
Non-farmer subsidy*Income < \$5000			0.92	0.40, 2.14

* p < .05 ** p < .01 *** p < .001

a. Private to all other sources of income includes private to private, private to work and private to any other non-pension sources.

The interaction terms shown at the bottom of Table 6 indicate that neither the farmers pension program nor the hsien and city-level subsidies had a differential effect on income change for those at the lower end of the income distribution. In separate analyses (not shown) we estimated a multinomial logistic model of changes in major source of income (private to pension, private to private (reference group) and private to other sources). The effect of the farmers program was consistent with the logistic regression results reported above and the hsien and city-level program continued to have little impact on income change.

Conclusion

The purpose of this study was to take advantage of a “natural experiment” in Taiwan in the form of a major policy change during the course of a national longitudinal survey of the older population. The major research question of interest was whether the initiation of public subsidy programs for older persons had an impact on the reliance of the elderly on private transfer income. This question is important because of the repercussions that public support programs may have on existing patterns of family support and the resulting effectiveness of those public support programs to improve elderly economic well-being.

The resulting evidence is mixed. With regard to the farmers pension program, we observe strong effects of this program on reliance on private transfers. Older persons who were likely to have qualified for this program were substantially more likely than others to have switched from private sources to pension as their major source of income between 1993 and 1996. In contrast, the hsien subsidy program appears to have had little impact on reliance on private transfers during the survey period (though the odds ratio was 1.20, the result was not statistically significant).

There are several possible reasons for the lack of effect of the hsien and city-level subsidy program. First, “natural experiments” are rarely ideal experiments in the arrangements of control and treatment areas or in the magnitude of the treatment. “Nature” does not read Campbell and Stanley (1963). In this case, there may have been a relationship between the likelihood of a DPP victory and the status of the older citizens in these hsien and cities that influenced the observed responses vis a vis other areas. In addition, the range of magnitudes in terms of the hsien subsidies and the relatively short duration of some programs are also likely to dampen the ability to discern clearly the responsiveness to the introduction of new public programs.

Second, the subsidies provided under the hsien program were much smaller and more variable than those provided under the farmers program. The maximum *annual* amount under the hsien program was \$20,000 NT (US\$ 758 in 1995 dollars) compared to \$36,000 NT (US\$ 1364) under the farmers program. Furthermore, whereas the farmers program has been ongoing continuously since June 1995, the hsien programs have been much more sporadic and short-lived. Those hsien where payments were the highest tended to be especially short-lived. As a result, the actual amount of money received under the hsien program may not have been sufficient to tip the major source of income from private to pension.

It is important to recognize that we are imposing a strong test of substitutability of public funds for private transfers by looking at changes in major source of income. In some cases, for example, family members may have reduced the funds given to an older person in response to the farmer or hsien program, but still remained the major source. In other cases, family members may have maintained their level of support but the public program funds exceeded what they were able to provide, so that the major source shifted, without implying any change in the amount of private transfers. Given these possible ambiguities, the analysis presented here must be regarded as a first estimate of the possible responsiveness of the current older cohorts in Taiwan to the advent of new pension or retirement programs. The results, though circumscribed by the special conditions of the program and available data, suggest that family financial support may be sensitive to new and/or enhanced programs, but the degree of substitutability will require more nuanced data. And, of course, any trade-off of funds does not imply a similar cutback in other aspects of support provided, such as co-residence, visiting, physical care or emotional support.

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Appendix

Table A-1. Percentage Distributions of Independent Variables among Adults age 67 Years and Older with Private Transfers as Main Source of Income in 1993, Taiwan

Determinants	Percentage	Number of older adults
Program indicators		
Farmer in 1993	45.2	609
Non-farmer, subsidy	13.0	170
Non-farmer, no program	41.8	532
Sociodemographic factors		
Age 64 to 69 in 1993	40.4	544
Age 70 to 79 in 1993	48.6	655
Age 80 and older in 1993	11.1	149
Male	41.7	562
Married in 1996	50.8	685
Mainlander ethnicity	6.5	87
Coresidence with child in 1996	72.7	980
Monthly income in 1993		
Less than \$ 5000 NT	46.1	621
\$ 5000 - \$ 19999 NT	44.6	601
\$ 20000 NT and above	8.0	108
Missing or don't know	1.3	18