J. of Population Studies
20 : 93-124, 1999, Population and Gender
Studies Center, NTU.

A Policy Solution to Reduce Poverty in Single-Mother Families? — An Examination of the Child Support Assurance System*

Chien-Chung Huang**

(ABSTRACT)

Single-mother families significantly increased since the end of 1980s in Taiwan, however, a great proportion of them is living under the poverty. Although a large body of studies has examined the issues of single-parent families in Taiwan, none of them have proposed a policy solution to resolve the disadvantageous economic status of these single-mother families. The Child Support Assurance System (CSAS) is designed with the dual goal of preventing poverty and promoting independence for single-mother families. Using the 1992-1994 Family Income and Expenditure Survey in Taiwan, this paper empirically examined the effectiveness of implementing CSAS in Taiwan. The results indicate that enforcing the CSAS should produce a high effectiveness with low costs. The most important benefit is the reduction in the poverty rate of these single-mother families and the improvement in their family income, which in turn improves their economic independence.

Key words: single-mother families, child support assurance system

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* The research was supported by grants from the Chiang Ching-Kuo Foundation and NICHD-HD 19375.
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The author is grateful to two anonymous referees and the editor of the journal for helpful comments, and would like to thank Dr. Irwin Garfinkel and Dr. Wen-Jui Han for their suggestions on this paper. Any opinions expressed here are solely those of the author.

人口學刊第 20 期
頁 93-124，民國 88 年 10 月
台北：台大人口與性別研究中心

減低女單親家庭貧窮的政策方案？—兒童扶助保證制度的檢驗

黃建忠*

（中文摘要）

臺灣自 1980 年代末期以來，女單親家庭的數目便有顯著的成長。然而，女單親家庭的貧窮率也偏高。雖然台灣已有許多的單親研究，還沒有研究針對女單親家庭的貧窮提出政策方案。兒童扶助保證制度是以預防單親家庭的貧窮與促進其獨立爲設計原則，其基礎是沒有居住在一起的家長也必須與子女分享其所得，而政府有責任爲這些小孩所應得的金額負起徵收責任。本篇文章檢視兒童扶助保證制度的概念，並利用 1992-1994 年的“家庭收支調查”來模擬兒童扶助保證制度對台灣單親家庭的效果。結果 顯示，它是一種低成本且高效益的方案，最重要的優點是它有效地增加女單親家庭的收入並減低她們的貧窮率。

關鍵字：單親家庭、兒童扶助保證

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A Policy Solution to Reduce Poverty in Single-Mother Families? — An Examination of the Child Support Assurance System*

Chien-Chung Huang**

I. Introduction

Previous studies have found that the increase in women's education and the decrease in the number of children largely contribute to the increase in divorced-mother families in Taiwan (Huang, 1999). There is no indication that these trends (increase in education and decrease in the number of children) are likely to be reversed in the near future. Studies have also found that women's economic status usually declines following marital dissolution (McLanahan, 1985; McLanahan and Booth, 1989; Morgan, 1989). These trends, and what we know about the importance of economic status on children's development, raise important questions about the impacts of marital dissolution and declining economic status on children's economic well-being in single-mother families.

In the United States, the federal government has taken a number of steps to prevent nonresident fathers from abandoning their children financially. Child support is the mechanism to require non-resident parents (usually fathers) to contribute their partial earnings to support their children. The enforcement of child support has been found to substantially reduce US's welfare caseloads and thus reduce single-mother families' dependence on welfare which in turn improve their economic status (Huang, Garfinkel, and Waldfogel, 1999).

Unlike the United States which considers the interest of children as the most

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important priority, judges in Taiwan have given more weight on the economic ability of parents raising children and thus the parent with the economic advantage (in most of the cases, it would be the father) is usually given the custody. In other words, custody right and economic ability are considered together and, therefore, child support has not been a problem in Taiwan. The 1996 amendment of Civil Code, however, has changed the legislative system to require the judge to consider the interest of the children as the priority in order to determine who will obtain the custody. As more and more mothers get the custody, it becomes important to consider the economic well-being of children, given the economic hardship experienced by most of single mothers in Taiwan (Huang, forthcoming).

No research in Taiwan, as of today, has been conducted to explore measures to protect the economic security of single-mother families and their children. Building on previous studies' findings about single-mother families in Taiwan (Huang and Hsueh, 1998; Huang, Forthcoming), this paper, therefore, will specifically apply child support mechanism to analyze its potential effects on Taiwan's single-mother families' economic well-being. In the next section, the literature on single-mothers in Taiwan will be briefly reviewed, followed by a review of child support system in the United States. The methodology used in this paper is presented in section IV and the empirical findings are presented in section V. The limitations and implications are discussed in the final section.

II. Previous Studies on Single-Mother Families in Taiwan

Although the issue of single-mother family has attracted growing public and academic concern in Taiwan, most of studies on single-mother families focused on social, economic, and/or emotional "difficulties" experienced by single parents with children (please see Hsueh and Liu, 1998 for a review). Although their findings can not be generalized to the entire population due to using non-probability samples, they have found some consistent results. Single-mother families tend to suffer from economic hardships because of lower human capital and working experience (Shu and Zhang, 1987; Wang, 1991; Tong 1992; Hong, 1993; Zhang and Hsueh, 1995) and social difficulties, including conflict between working and child care, and the relationship

between parent and child (Xie and Ma, 1989; Lin and Qin, 1992; Huang, 1993). Recently, some studies have shifted the focus to the trends and determinants of single-mother families (Hsueh, 1996; Huang and Hsueh, 1998; Hsu, 1998; Huang, 1999; Huang, Forthcoming; Huang, Garfinkel, and Han, 1999). Using the data from 1988 to 1994 Family Income and Expenditure Survey, Huang and Hsueh (1998) found that almost 1 in every 23 families with children (4.4%) was headed by a single parent in 1988, it had increased to 1 in every 18 families (5.4%) in 1994. This increase was primarily explained by the increase in divorce and widowed parents. Huang (1999) indicated that the number of single-mother families significantly increased since the end of 1980s, and both the increase in women's economic independence and the decrease in the number of children are important contributing factors.

With this dramatic increase in single-parent families, studies have also examined the economic well-being of these single-parent families. Chen (1996), using 1984-1994 Survey of Personal Income Distribution in Taiwan, defined poverty line as 50% of mean income and found that female-headed households are more likely to be poor (20%), particularly for the households headed by single mothers aged below 35 (37%) and over 55 (23%). Using data from 1980-1995 of Family Income and Expenditure Survey, Huang (Forthcoming) also found that single-parent families, particularly single-mother families, are more likely to be in disadvantaged socioeconomic status as measured by educational attainment, their family income, expenditures, Engel index, and poverty rates. Partly due to the limited resources associated with single-parent families (e.g., lack of a second earner at home, and lack of the social support network from relative-in-laws), the economic disadvantageous status has been common in both eastern and western countries.

III. Single-Mother Families and Child Support in the United States

Due to an increasing rate of illegitimacy and a high divorce rate in the United States, the size of single-mother families is substantially increasing from 3.4 million in 1970 to 9.9 million in 1996. One of every eight families with children was headed by a single-mother in 1970, and the ratio was one of every four families in 1996. Unfortunately, economic insecurity of single-mother families remains. In 1996, the percentages of

single-mother families below 200%, 100%, and 50% of poverty line were 71%, 43%, and 21% respectively (Green Book, 1998). Virtually, more than two out of three single-mothers are economically vulnerable. The increase of single-mother families and their persistent disadvantage has brought increased public and political concerns over the roles of child support, given a large body of studies which have found that the enforcement of child support obligations would likely improve the economic status of single mothers and their children (Garfinkel and Oellerich, 1989; Sorenson, 1997; Miller, Garfinkel, and McLanahan, 1997; Garfinkel, McLanahan, and Hanson, 1998; Huang, Garfinkel, and Waldfogel, 1999).

Specifically, studies have found that only about a quarter of fathers paid for child support (Garfinkel and Oellerich, 1989; Miller, Garfinkel, and McLanahan, 1997). Although studies have shown that non-resident fathers' income are generally lower and more likely to be in low-income than are the fathers in two-parent families (Garfinkel and Oellerich, 1989), the truth is that even low-income fathers could have afforded to pay substantially more than they did (Miller, Garfinkel, and McLanahan, 1997). If the system was able to get all non-resident fathers to pay for their share of child support payment (i.e., a perfect enforcement), it could reduce the poverty gap of children who are potentially eligible for child support payment by 25 percent (Meyer et al. 1992). Most importantly, reductions in poverty and economic insecurity, in turn, would increase child well-being and school achievement (McLanahan and Sandefur, 1994; McLanahan, Seltzer, Hanson, and Thompson, 1994; Graham, Beller, and Hernandez, 1994; Knox, 1996).

"Deadbeat dads", however, is not the only reason for the low enforcement rate; the judicial, legislative, and executive branches of government are also responsible for setting an appropriate award and collecting what is owed. When the enforcement of child support obligations is a state responsibility, the system indirectly condoned and, therefore, fostered parental irresponsibility. This, in turn, contributes to poverty and welfare dependence among single mother families (Garfinkel, 1992). In addition, the system is also highly inequitable because each state has its own system. Recognizing the weaknesses of the current child support system, Child Support Assurance System (CSAS) is designed with the dual goal of preventing poverty and promoting economic

independence. The state of Wisconsin has been the pioneer to enforce such system and the outcomes have been shown successful (Meyer et al., 1992).

IV. The Design of Child Support Assurance System

The foundation of a Child Support Assurance System (CSAS) is that nonresident parents are responsible for the monetary support of their children, and government is responsible for assuring that children who live apart from their parents receive the support to which they are entitled. The major components of CSAS include a child support standard, a routine income withholding, and an assured child support benefit (Garfinkel, 1992) as follows:

Determining a Child Support Standard: A child support standard or guideline is a numerical formula for establishing the amount of child support obligations. There are three major approaches to determine child support standards: cost sharing, income sharing, and percentage-of-income. The amounts of cost sharing are based on the cost of raising a child. Both income sharing and percentage-of-income standards are based on the concept of income sharing. This principle assumes that, by parenting a child, parents take on the responsibility to share income with that child in approximately the same proportion, as they would have if the family had not separated. Income sharing standards calculate awards on the basis of the income of both parents, computed by multiplying the combined income of both parents by percentages that decline as income increases. The percentage-of-income standards are equal to a fixed percentage of the nonresident parent's income, varied by the number of children owed support (Williams, 1987; Garfinkel and Melli, 1990).

Because the cost of raising a child differs considerably, depending on the income of the parents, setting an award amount unrelated to the income of the parents is impossible. Additionally, the incomes of nonresident parents generally increase over time; that is, income sharing and percentage-of-income standards reduce economic insecurity, not only by current income sharing from nonresident parents but also by the potential income of nonresident parents. One of the critical differences between income sharing and percentage-of-income standards is that the percentage of income of the nonresident parent to be paid in child support remains fixed in the percentage-of-income standard but

declines substantially as income increases in the income sharing standard. Both the proportionality of the percentage-of-income standard and the regressivity of the income-shares standard were justified by their architects (Garfinkel, 1992). Moreover, some researchers conducted comprehensive reviews and found that the percentage in both guidelines are consistent with the broad range of scientifically reliable estimate of the cost of children (Van der Gagg, 1982; Olson, 1983; Espenshade, 1984; Bassi, Aron, Barnow, and Pande, 1990).

Economic studies on two-parent families provide mixed evidence on whether the percentage of income spent on children declines as income increases. The empirical evidence is consistent with either standard, making it clear that the choice between these two standards is inevitably a value judgment. However, a regressive child support standard as well as a regressive tax is hard to justify. It is hard to defend legislation that requires a working-class, nonresident parent to contribute a much larger proportion of his income to his children than a middle-income, nonresident parent, and that also requires the middle-income, nonresident parent to contribute a much larger share of his income than an upper-middle-income nonresident parent. Thus, it seems that the percentage-of-income standard have wider appeal than the income-shares standard. Additionally, the percentage-of-income standard is more simplicity than the income-shares standard.

The next question is how much of a percentage of income a nonresident parent should share with his child. The prevailing approach to determine the percentage is to base the amount on the proportion of the income that parents spent on their children when they all lived together. The estimated proportions were variant among studies, it ranged from 11% to 23% for the first child, 19% to 34% for two children, and 25% to 41% for three children (Van der Gagg, 1982; Bassi, Aron, Barnow, and Pande, 1990; Bassi and Barnow, 1993). The shares of income devoted to the second and third child were about half that devoted to the first. Based on value judgments and practical considerations, the Wisconsin guideline took 17% of gross income of the nonresident parent for one child, and 25%, 29%, 31%, and 34% for two, three, four, and five or more children, respectively (Garfinkel, 1992).

Routine Income Withholding: The Family Support Act of 1988 requires that all

states adopt routine income withholding laws. Routine income withholding means that once an award has been determined, the nonresident parent who owes child support has the award payment withheld from his paycheck. This money goes to the local government and is, in turn, sent to the resident parent each month. This method not only increases both the size and the timeliness of child support payments but also decreases the stigma in the program. Garfinkel and Klawitter (1990) pointed out that routine income withholding has a substantial impact on the effectiveness of child support collection, increasing by 11% to 30%. In addition, since everyone who owes child support is subject to income withholding, it removes the stigma and punishment from the collection process; that is, routine income withholding is a nonstigmatizing and preventive measure while at the same time it improves children's economic security. Even the requirements by Family Support Act, the enforcement of child support continues to be largely varied among states, and whether a child receives support depends in large part on the enforcement of the states in which he or she resides (Garfinkel, Miller, McLanahan, and Thomas Hanson,1998). Based on the poor performance in some states, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 further strengthened income withholding by reducing the time for employers to remit withheld wages to 7 business days and allowing issuance of electronic withholding orders by State agency and without notice to obligor. The collection system will change from one where payment is often discretionary to one where payment is compelled and automatic (Legler, 1996).

Determining an Assured Benefit: It is worth noting that a high assured benefit would be likely to produce some possible effects. The higher the assured benefits, 1) the larger the re-distributive element would appear in the program, 2) the more the assured benefits would reduce economic insecurity, and 3) the greater probability it would be perceived as a welfare benefit. Most importantly, the higher the assured benefit, the greater the number of nonresident parents whose child support payments would be less than the assured benefit, and the more it would cost. Therefore, determining an appropriate assured benefit level depends on a value judgment about this program: whether it is a welfare or non-welfare program.

CSAS in the U. S. is designed not to be viewed as a welfare program (Garfinkel,

1992). To emphasize the distinction between CSAS and a welfare program, the assured benefit level is designed to supplement the earnings and other income of the resident parent. Lerman (1989) also argued that the assured benefit should not be perceived as a welfare benefit, and he suggested that the benefit level should be set so that the overwhelming majority of nonresident parents would be able to afford to pay it. If the assured benefit were no higher than most private child support orders, then the government's role would amount to nothing more than making up for its own failure to adequately enforce private child support obligations. Garfinkel (1992) indicated that if the benefit level is such that 75% of nonresident parents' child support obligations exceed it, the integrity of the program is unlikely to be compromised.

V. Methodology

A. Data

The data is from the Survey of Family Income and Expenditures (SFIE) 1992-1994. SFIE investigates the household income and expenditure patterns in Taiwan and is conducted annually by the Directorate General of Budget, Accounting and Statistics (DGBAS), Executive Yuan, Taiwan. The survey has a sampling rate of about 0.4 percent of the national population and includes 16,434 households. Since the number of single-mother families in 1994 was small, in order to avoid a sampling error, the author pooled 1992-1994 data into one data set, with all income adjusted to 1994 New Taiwan (NT) dollars by the CPI. The weight of each case will be divided by three because of this pooling.

Single-mother family in this paper is defined as a mother who is currently divorced, separated, widowed, or never-married and is living with unmarried children under 18. Ideally, the simulation should cover the whole population; previous studies, however, have showed the number of never-married mother families is very small and with large variance (Huang, Forthcoming). Additionally, one purpose of this simulation is to estimate the ability of nonresident father to pay child support, and there is no meaning to estimate the ability for widowed-mother families. Therefore, for simplicity, this paper focuses on divorced- and separated-mothers, which is also the largest subgroup of

single-mother families in Taiwan (Hsueh, 1996; Huang and Hsueh, 1998; Huang, forthcoming).

B. Method

1. The Estimation of the Income of Nonresident Fathers

The ability of a nonresident father to pay child support is determined by his income and the number of children owed support. However, no nationally representative data exist containing both types of information in Taiwan as well as in the United States. In the United States there are two major approaches to deal with this problem: Garfinkel and Oellerich (1989) utilize an indirect method to predict the nonresident father's income using the characteristics of the resident mother. They first estimate the relationship between a husband's income and his wife's characteristics such as age, education, and geographic location. Information on this relationship is then used to predict an initial value of the nonresident father's income based on assortative mating. They also adjust the initial estimate by the earning differences among married men with children, divorced and separated men with children, and never-married men. Sorenson (1997) attempts to identify a sample of nonresident fathers from 1990 Survey of Income and Program Participation (SIPP), but her sample of nonresident fathers is only 85 percent as large as the number of custodial mothers in SIPP. Sorenson then reweighs observations on nonresident fathers to match the number of custodial mothers.

Both approaches are based on positive assortative mating assumption. In his classic study of the marriage market, Becker (1981) uses the term positive assortative mating to describe the notion that opposites do not usually attract. Given that the gains from marriage for a given couple are higher if the two individuals are relatively similar in terms of socioeconomic characteristics such as education, age, and race, positive assortative mating is the optimal outcome in the marriage market. Empirical evidence on marriage patterns is consistent with the theory. In around 60 percent of marriage, the husband is the same age as the wife or only one to three years older (Miller, Garfinkel, and McLanahan, 1997). In addition, over 50 percent of couples are in the same educational category (Sweet and Bumpass, 1989). Weiss and Willis (1997) also indicate that positive assortative mating is likely to enhance the stability of the marriage,

particularly whose based on educational attainment mating.

Because there is no nonresident father data in Taiwan, the author follows Garfinkel and Oellerich's approach (1989) to estimate the income of nonresident fathers. The author first estimates the relationship between a mother's characteristics and the income of her children's father. The estimated parameters are then used to predict the income of nonresident fathers.

This author makes the following simplifying assumptions: 1) The marital status of the resident mother is the same as that of the nonresident father; for example, if the resident mother is divorced or separated, the nonresident father must also likewise be divorced or separated. Because the remarriage rate is higher for men than women, this assumption will lead to an underestimated income of nonresident fathers. 2) The positive assortative mating occurs in married couples.

The income equation for a sample of married couples with children under 18 is estimated. The equation takes the following form:

$$Y_h = X\,b + \varepsilon \qquad (1)$$

where Y_h is the natural log of the earned income of husbands; X is a set of wives' characteristics, including age, age square, education, region, and an interaction variable between age and education; and ε is a random disturbance assumed uncorrelated with X. Because the earned income of divorced and separated men is less than their married counterparts (Garfinkel and Oellerich , 1989), their predicted income will be overestimated if the estimated parameters from equation (1) are used to impute income of nonresident fathers. To account for this difference, the author estimates another income equation:

$$Y_m = X_m\,b + d\,M + \mu \qquad (2)$$

where Y_m is the natural log of the earned income of men; X_m is a set of men's characteristics, including age, age square, education, region, and a interaction variable between age and education; M is a set of dummy variables for different marital statues with the married state as the excluded category; and μ is a random disturbance. To

estimate the income of the nonresident divorced or separated fathers, the coefficients estimated in equation (1) together with the dummy variable coefficients estimated in equation (2) are multiplied by the known demographic characteristic of the divorced or separated mothers and the predicted marital status of the nonresident father; that is,

$$\bar{Y}_f = Xb + d\,M \qquad (3)$$

where $\bar{Y}_f$ is the predicted income of the nonresident divorced or separated father.

2. The Simulation of Child Support Assurance System in Taiwan

Determining a Child Support Standard: Based on the above arguments in section IV, the percentage-of-income standard is applied to simulate CSAS in Taiwan. However, it is difficult to judge the suitability of the Wisconsin or other guidelines for Taiwan because there have been no studies on expenditures for children in Taiwan. Since the Wisconsin guideline represents a high standard in the U.S., the Wisconsin guideline is used as the upper bound of a child support standard, and the following alternative model as the lower bound of the standard: 8% of gross income of the nonresident parent for one child, and 12%, 16%, 18% and 20% for two, three, four, and five or more children, respectively. The amount for one child is around 50% of the Wisconsin guideline, and the amount for additional children is based on the findings that the expenditures for the second and third child was about half that devoted to the first. Since there is no research on the cost of raising children in Taiwan, the choice of these two standards is arbitrary. However, the simulation of these two standards provides a comparison of the effectiveness of different child support standards and a crude basis for further research on cost of raising children in Taiwan.

Routine Income Withholding: For simplicity, the long term effects of CSAS is estimated, which assumes that each case eligible for child support gets an award and an appropriate amount, and all the amount under routine income withholding. In other words, the inefficient enforcement of child support administration has been ignored. Based on the U. S. experience, 100% routine income withholding, a perfect system, is very hard to achieve. Therefore, the estimated results should be explained with caution and could be taken as maximum effect of child support assurance system in Taiwan.

Determining an Assured Benefit: If the purpose of the assured benefit is to keep the economic well-being of children in single-mother families above the poverty line, then poverty line is an appropriate start for assured benefit which is $ 72,000 for one child per year in 1994. For estimating the effects of different assured benefits, the author also uses other assured benefits. They are NT$ 36,000 and $ 54,000 for one child per year which are around 50% and 75% of the poverty line in 1994 respectively (Exchange rate: US$ 1= NT$ 27 in 1994). The assured benefits for sequential children take account of economies of scale that the expenditures for the second and third child are about half that devoted to the first child. For example, the amounts of the second, third, fourth, fifth, and sixth child in lowest assured benefits are equal to NT$ 18,000, $ 18,000, $ 9,000, $ 9,000, and $ 9,000, respectively. For the Wisconsin guideline, the overwhelming majority of nonresident parents are able to afford the first and second assured benefits, and 80% of nonresident parents are able to afford the third assured benefit. For the alternative guideline, the overwhelming majority of nonresident parents are able to afford the first assured benefit, while only 75% and 40% of nonresident parents are able to afford the second and third assured benefits respectively. Without the support of related study in Taiwan, the choice of the assured benefits is kind of arbitrary and its purpose is only to provide a comparison of different benefits. Further research is warranted to study expenditure pattern of single- and two-parent families and appropriate assured benefit for Taiwan.

3. The Effects of Child Support Assurance System in Taiwan

The following indices are used to assess the effects of child support assurance system in Taiwan: income, poverty rate, cost, and payments. For income, since the mean number of persons in single parent families was less than in two parent families, the lower total income of single parent families may not indicate lower economic well-being. For adjusting the family-size differences, an equivalence scale that gave respective weights of 1.0, 0.7, and 0.5 to first adult, subsequent adults, and children in the family is used (for weighting method, see Duncan, Gustafsson, Hauser, Schmaus, Jenkins, Messinger, Muffels, Nolan, and Voges, 1995). Because income from nonresident fathers is not measured in SFIE and given that only 6 percent of divorced parents have alimony (Zhang and Hsush, 1995), the author ignores the income. The

estimated payment from CSAS is added to the income of resident mothers to assess the effectiveness of CSAS.

The poverty line has been very low in Taiwan, and is periodically revised by government instead of adjusting itself by consumer price index (CPI). Even in 1994, the poverty line for one person is around US$2,500 in Taiwan which was only one third of poverty line in United States ($7,547 in 1994). In contrast, the mean incomes per capita were US$10,566 and $16,555 for Taiwan and United States respectively, and the ratio was 64% in 1994. The poverty line in Taiwan only represents a very low level of subsistence. Thus, in addition to official poverty line, the author used median-income-based poverty line (Duncan, Gustafsson, Hauser, Schmaus, Jenkins, Messinger, Muffels, Nolan, Ray, and Voges, 1995) to assess the relative poverty in Taiwan society. The author defined a family to be in median-income-based-poverty if its size-adjusted income was below 50 percent of the median. The 50 percent line was defined using the distribution of size-adjusted family income for all families with children. Since median-based poverty lines are relative to median, the resulting poverty estimates reflect the degree of inequality of the distribution of size-adjusted family income. Finally, aggregate cost and payment are estimated to evaluate the cost and efficiency of child support assurance in Taiwan.

4. The Behavioral Responses of Child Support Assurance System

In addition to economic security of single-mother families, the establishment of CSAS will have unavoidable effects on other behaviors, especially labor supply and marriage. In terms of the effects on labor supply, CSAS increases nonearned income of resident mothers. It provides an incentive to decrease work efforts of the mothers given that leisure is a normal good. Additionally, for nonresident fathers, CSAS reduces the take-home pay, but the impact of the payments on work effort of any nonresident father is underdetermined, depending on the calculation method of payments (fixed or proportional obligations) and the income and the substitution effects of the payments. A fixed obligation is a court ordered award that payments will not change as the nonresident father's income changes. It is a fixed levy on a nonresident father. In this case, child support payments will reduce the nonresident fathers' income but not change the marginal value of an extra hour of their work; that is, fixed obligations only

have income effect and no substitution effect. Thus, in fixed obligations, because the net wage rate of the nonresident father does not change, the nonresident father will replace some leisure with work to make up for income lost through the payments. In a sense, the individual tends to work harder to maintain his previous income level.

On the other hand, a proportional obligation operates like a proportional income tax. The payments increase as wages rise. The payments then lower the opportunity cost of an hour of leisure by reducing the wages that the worker receive. In this case, child support payments, as in the fixed obligation, reduce the disposable income of the nonresident father. However, it also reduces the marginal value of an extra hour of his work. In other words, proportional obligations have both income and substitution effects. The income effect of decreased income increases labor supply of nonresident fathers, while the substitution effect of declined net wage rate reduces labor supply of them. Thus, the final effect is underdetermined, and is dependent on whether the income effect dominates the substitution effect or the substitution effect dominates the income effect. If the individual's preferences are such that the income effect outweighs the substitution effect, the result of the payments is a decrease in the daily consumption of leisure and a consequent increase in work. In contrast, when the substitution effect is greater than the income effect, the number of working hours decreases in response to a wage decrease. In short, the income and the substitution effects of the payments could increase or reduce the nonresident father's labor supply, depending on the calculation method of payments and the income effect dominating the substitution effect or the substitution effect dominating the income effect.

With respect to the effects on marriage, for single mothers, CSAS increase nonearned income and then reduce the gain from remarriage. For married couples, CSAS decrease the gain from divorce for fathers and, therefore, decrease the probability of marital dissolution. On the other hand, it is expected to lower the mother's costs of divorce by raising her income in the divorce state. Therefore, the final effect of CSAS depends on which effect dominates the other. Nixon (1997) found increases in child support enforcement discourage divorce among couples with children, and implied that the opposing effect on father is dominant. In the area of never married mothers, CSAS increase the costs for nonresident fathers and will lower the incidence of nonmarital

childbearing. Sonenstein, Pleck and Ku (1994) found that a substantial proportion of adolescent males are aware of paternity establishment and may modify their sexual behavior and contraceptive use accordingly, especially if their peers are doing so. Case (1998) and Garfinkel et al. (1999) also found that stronger paternity laws reduced nonmarital childbearing.

Indeed, the establishment of CSAS will have effects on labor supply and marriage besides income security of single mother families. But due to data limitation, the author will not simulate the changes of labor supply and marriage in this paper. The finding should therefore be explained with caution.

VI. Results

A. The Income of Nonresident Fathers

The author follows the Garfinkel and Oellerich's approach (1989) and utilizes an indirect method to predict the nonresident father's income. The essential assumption of the approach is based on assortative mating assumption (Becker, 1981). Therefore, before estimating the income of nonresident fathers, the assortative mating assumption should be tested. Table 1 shows the characteristics of couples from 1992-94 SFIE. The first part of the table reports age and years of education differences between spouses for the sample of two parent families. Both the age and years of education of husbands are higher than those of wives. Husbands are 3.03 years older than their wives on average, and tend to be more educated than their wives by 0.91 years. In the United States, the differences of age and years of education were 2.52 and 0.28 (Miller, Garfinkel, and McLanahan, 1997). The differences between the two nations may be due to cultural differences. Husbands should be older than wives in Chinese tradition, and education opportunities are focused on men in earlier cohorts. The correlation between the spouses' age and years of education is shown in the second panel of table 1. Both coefficients of age, 0.80, and years of education, 0.72, are significantly positive, suggesting a positive assortative mating.

Table 2 presents the regression estimates for husband's annual income (natural logarithm) based on wife's characteristics. In the first column of the table, the author

includes no interaction between age and years of education and specifies age as a linear function. The coefficients are all statistically significant and all are in the expected direction. Both wife's age and years of education have significantly positive effects on husband's income. People living in the two largest cities (Taipei and Kaohsiung) have significantly higher income than those living in other cities. In the second column, age is specified as a quadratic function to examine the assumption of curvilinear function, and years of education is interacted with age. As expected, the results are in the right direction. The significant negative effect of wife's age square indicates that age is not a linear function; the significant negative effect of the interaction variable of wife's age with education suggests that education is more pronounced for young people. For the prediction of a nonresident father's income, the coefficients from the second column are used because the model explains more variances of husband's income than the other model and is more consistent with previous research (Miller, Garfinkel, and McLanahan, 1997).

Table 3 shows the annual earning differences among fathers. Divorced fathers only earned 74% that of fathers in two-parent families, and separated fathers earned even less, 67%. The differences may result from different individual characteristics of fathers as well as the difference in marital status. In order to test this assumption, a regression estimate for a father's annual income (natural logarithm) based on father's characteristics is analyzed. Table 4 presents the results. It is noteworthy that, all else being held constant, being divorced or separated have significant negative effects on father's income. This result indicates that the incomes of nonresident fathers would be overestimated if the author had used the parameters from Table 2. Therefore, the parameters from Table 2 together with the divorced and separated parameters estimated in Table 4 are multiplied by the known demographic characteristic of the divorced or separated mothers to predict the earning income of the nonresident father. Estimated average incomes for divorced and separated nonresident fathers are NT$ 581,819 and NT$ 516,229 respectively in 1994, around 74% and 65% of the earnings of fathers in two-parent families. The estimated incomes of nonresident fathers are then used to predict the potential child support payments, and, in turn, estimate the costs of CSAS.

B. Costs of CSAS

The costs and effectiveness of CSAS in 1994 are shown in Table 5. For the Wisconsin guideline, because the child support payments of a great majority of the nonresident parents are above the first and second assured benefits, the costs of child support assurances are near zero if the government adequately enforces private child support obligations. The cost of the third assured benefit, which 80% of nonresident parents are able to afford, is NT$43 million. For the alternative guideline, the costs of the first, second, and third assured benefits are NT$32, $777, and $1,851 million respectively.

C. Effectiveness of CSAS

Since the dual goal of a child support assurance system is to reduce resident parents' poverty and improve their economic well-being. The following analyses are focusing on these two outcomes.

1. Income

The average payments to divorced- and separated-mothers would be around NT$120 thousand for the Wisconsin guideline, and would be between NT$59 thousand and NT$90 thousand for the alternative guidelines. After enforcing the CSAS, the economic status of divorced- and separated-mother families would be significantly improved. Specifically, both total and size-adjusted incomes of divorced- and separated-mother families would increase by between 11% (alternative guideline, assurance 1) and 22% (Wisconsin guideline, assurance 3). It is noteworthy that, except for the assurance 1 and 2 under alternative guideline, single mothers' size-adjusted incomes after enforcing CSAS are higher than that of two-parent families. Before enforcing CSAS, the size-adjusted income for divorced- and separated-mother families is lower than that for two-parent families by 9%, but they are higher by between 5% (alternative guideline, assurance 3) and 11% (Wisconsin guideline, assurance 3) after enforcing the CSAS. If the goal of CSAS is to equalize the income between single- and two-parent families, the results implies that the Wisconsin guideline and 100% of poverty line assured benefit seem too high for Taiwan.

2. Poverty

Since the official poverty line is very low in Taiwan, CSAS would have a significant effect on poverty. As shown in Table 5, in 1994 the official poverty rates of divorced- and separated-mother families were 4.36%. After enforcing the CSAS, it would decrease by over 75% to between 1.06% (alternative guideline, assurance 1) and 0.71% (Wisconsin guideline, assurance 3). In other words, only 1 in 100 divorced- and separated-mother families would have been poor in 1994 if the CSAS had been implemented. These results highlight the potential effects of CSAS to raise most divorced- and separated-mother families out of the poverty. As an alternative measure to look at how exactly CSAS reduce the poverty among single-parent families, the poverty gap — how far below the poverty threshold poor families are living — is calculated. The enforcement of CSAS produces a dramatic decrease in the poverty gaps. The percentages of decrease in the poverty gaps would be between 73% and 94%.

Bearing in mind that the official poverty line is low in Taiwan, an alternative poverty threshold is used — 50% of median-income. If this threshold is used, we can see from Table 5 that more single-parent families would be below this poverty threshold. Specifically, the percentages of being in poverty are 5.03% and 9.48% for two-parent families and single-parent families, respectively, comparing to 1.56% and 4.36% using the official poverty line. In terms of the effects of CSAS on the poverty rate of single-parent families using this alternative threshold, the results are substantial. The poverty rates of divorced- and separated-mother families would significantly decrease by over 54% to between 1.41% (Wisconsin guideline, assurance 3) and 4.34% (alternative guideline, assurance 1). In short, even using this alternative poverty measure, CSAS could effectively move more than half of divorced- and separated-mother families out of poverty. The results on the poverty gap are also consistent with the above findings. CSAS would dramatically decrease the poverty gaps by over 63%.

VII. Conclusion

Single-mother families have been significantly increased since the end of 1980s in Taiwan, and a great proportion of them is living in poverty. This paper has empirically examined a potential policy solution to reduce the poverty rate of single-mother families

in Taiwan. The findings indicate a potential benefit of implementing a child support assurance system. Specifically, a child support assurance system (i.e., requiring non-resident fathers to share the cost of rearing children and government enforcing the system effectively) not only reduce single-mother families' poverty rate, but also increase their family income which in turn improve their economic independence. Although the disadvantageous economic well-being of single-parent families has been discussed widely, no studies has, as of today, yet proposed a policy to address this issue. This is the first paper trying to apply other country's proposal to respond this issue. Although other country's proposal does not necessarily apply to Taiwan, it is a starting point to specifically look at the issues and the possible solutions.

The simulation, however, has several limitations. First, because there is no related studies in Taiwan on issues such as family expenditures on children, some assumptions of the simulation are arbitrary. Further research is warranted to study the expenditure pattern of families with children in order to understand how the expenditure is distributed among family members. Second, behavioral responses such as labor supply and marriage behaviors are not simulated due to data limitations. The behavioral response may decrease the effects of CSAS on economic security of single-mother families; however, the empirical findings in the United States suggest that the behavior response is not strong. Third, the simulated results are obtained under a perfect system scenario (each eligible family should get an award and an appropriate award amount in which should be fully collected), which is very hard to achieve in a short term. The estimated results should be explained with caution and be considered as a maximum effect of child support assurance system. Even though, the simulated results are encouraging and suggest that child support assured system is a potential policy response to insure the economic well-being of children in divorced- and separated-mother families in Taiwan. In addition, single fathers head 40 percent of single-parent families in Taiwan. Therefore, it is important to examine the effects of CSAS on economic security of single-father families in the near future.

Table 1: Correlation Between Age and Education of Spouses in Two-Parent Families

Unit: Year	Parameter Estimate (Standard Deviation) Taiwan	Parameter Estimate (Standard Deviation) United States
Difference Between Husband's and Wife's:		
Age (age of husband minus age of wife)	3.03 (4.26)	2.52 (1.28)
Education (years of education of husband minus years of education of wife)	0.91 (2.64)	0.28 (2.94)
Correlation Between Husband's and Wife's:		
Age	0.798***	0.878***
Education	0.715***	0.638***
N	25437	7056

*Note: *** indicates the significant level lower than 0.001.*
Sources: Taiwan — Survey of Family Income and Expenditures, 1992-94.
United States — Miller, Garfinkel and McLanhan (1996) table 2, Sipp 1984-1990.

Table 2: Regression Estimates for Husband's Annual Income (Natural Logarithm) by Wife's Characteristics

Variables	Parameter Estimate	Parameter Estimate
Wife's Age	0.0095 (0.0004)***	0.0609 (0.0030)***
Wife's Years of Education	0.0506 (0.0008)***	0.0634 (0.0046)***
Wife's Age Square	---	-0.0006 (0.0000)***
Wife's Age × Wife's Years of Education	---	-0.0003 (0.0001)**
Taipei City[1]	0.1598 (0.0075)***	0.1521 (0.0074)***
Kaohsiung City[1]	0.0841 (0.0103)***	0.0792 (0.0102)***
Constant	12.6029 (0.0187)***	11.5853 (0.0719)***
N	25480	25480
R^2	0.1788	0.1903

Note: 1. Other Cities is the reference group.
*2. ** indicates the significant level lower than 0.01.*
**** indicates the significant level lower than 0.001.*
Standard errors are in parentheses.
Source: Survey of Family Income and Expenditures, 1992-94.

Table 3: The Annual Earning Differences among Fathers

	Parameter Estimate (Standard Deviation)	Ratio (Divorced or Separated Fathers / Fathers in Two Parent Families)
Fathers in Two Parent Families	790,802 (412,641)	
Divorced Fathers	582,583 (331,771)	0.74
Separated Fathers	533,781 (317,646)	0.67

Source: Survey of Family Income and Expenditures, 1992-94.

Table 4: Regression Estimates for Father's Annual Income (Natural Logarithm) by Father's Characteristics

Variables	Parameter Estimate
Age	0.0658 (0.0032)***
Years of Education	0.0628 (0.0046)***
Age Square	-0.0007 (0.0000)***
Age × Years of Education	-0.0003 (0.0001)**
Taipei City	0.1507 (0.0074)***
Kaosheng City	0.0662 (0.0100)***
Other Cities	Reference group
Divorced Father	-0.2527 (0.0207)***
Separated Father	-0.3358 (0.0387)***
Fathers in two parent families	Reference group
Constant	11.3799 (0.0807)***
N	25480
R^2	0.2065

*Note: ** means the significant level lower than 0.01.*
**** indicates the significant level lower than 0.001.*
Standard errors are in parentheses.
Source: Survey of Family Income and Expenditures, 1992-94.

Table 5: The Costs and Effectiveness of CSAS in 1994

	Mean Income	Size-adjusted Income	Official Poverty Rate (Gap: Million)	Median-income Poverty rate (Gap: Million)	Cost (Million)	Aggregate Payments (Million)
Status Quo	553,765	246,388	4.36 (148)	9.48 (132)		
Wisconsin Guideline, Assurance 1	673,735	299,463	0.71 (11)	1.74 (16)	-	6,980
Wisconsin Guideline, Assurance 2	673,749	299,468	0.71 (11)	1.74 (16)	1	6,981
Wisconsin Guideline, Assurance 3	674,488	299,749	0.71 (9)	1.41(13)	43	7,024
Alternative Guideline, Assurance 1	613,034	272,392	1.06 (40)	4.34 (47)	32	3,448
Alternative Guideline, Assurance 2	625,845	277,913	0.87 (23)	3.62 (31)	777	4,194
Alternative Guideline, Assurance 3	644,300	286,283	0.71 (12)	2.39 (19)	1,851	5,267

Note: 1. The mean and size-adjusted incomes are NT$930.8 and NT$270.8 thousand for two-parent families.

2. The official and size-adjusted median-income poverty rate are 1.56 and 5.03 for two parent families.

3. Wisconsin Guideline is17% of gross income of nonresident parent for one child, and 25%, 29%, 31%, 34% for two, three, four,and five or more children, respectively. Alternative Guideline is 8 % of gross income of nonresident parent or the insured for one child, and 12%, 16%, 18%, 20% for two, three, four, and five or more children, respectively.

4. Assurance 1 means the assured benefits is NT$36, $54, $72, $81 thousand for one, two, three, and four children respectively, and $9 thousand for additional child.

5. Assurance 2 means the assured benefits is NT$54, $81, $108, $121 thousand for one, two, three, and four children respectively,and $13 thousand for additional child.

6. Assurance 3 means the assured benefits is NT$72, $102, $132, $147 thousand for one, two, three, and four children respectively,and $15 thousand for additional child.

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