Welfare Magnets, the Labor-Leisure Decision and Economic Efficiency

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Dedication

To my wife and my family

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Abstract

This thesis examines the issue of welfare recipiency. In the first chapter, I develop a model designed to capture the fiscal externalities associated with redistributive policy in a system of jurisdictions. Previous work in the migration literature ignores work-disincentive effects and concludes that relatively generous jurisdictions will attract welfare recipients but repel workers. I present a model that integrates migration with labor-leisure choice and I find that inclusion of labor-leisure effects unambiguously worsens the fiscal externalities of redistribution. In addition, I derive conditions under which an increase in redistribution will harm its beneficiaries.

In the second chapter, I address the issue of benefit harmonization. Within both the European Union and the United States, advocates of redistribution have suggested that benefits be "harmonized" at levels offered by their most generous members in order to protect those members from the fiscal externalities associated with redistribution, and these advocates further suggest that such a harmonization would enhance economic efficiency. The economic-efficiency argument is bolstered by traditional work in the public finance literature, but the work from which this conclusion is drawn does not account for the work-disincentive effects associated with redistributive policy. I find that, when work-disincentive effects are considered, the process of benefit harmonization need not improve economic efficiency unless the level at which benefits are harmonized is sufficiently low.

The first two chapters found that interstate welfare differentials will induce migration and labor-leisure choice. In the third chapter, I provide an empirical examination of the extent to which welfare generosity affects welfare recipiency in the United States. I improve on previous empirical work in a number of respects: I employ a more extensive data set, I calculate an improved measure of the welfare benefit package, and I use a better estimation technique. I find mixed evidence for the importance of welfare generosity: benefit level is positive but insignificant, while two related variables exert positive and significant effects on welfare recipiency.

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In the second chapter of this dissertation, I consider a model that contains both migration and labor-leisure choice. I find that the inclusion of labor-leisure choice unambiguously increases the absolute number of recipients in the federation (relative to traditional work that considers only migration) and thereby decreases the marginal impact of additional income-maintenance expenditures on the well-being of the poor. In particular, I find that traditional work has understated each of the three primary fiscal externalities associated with income maintenance programs: migration is higher, economic efficiency is lower and the improvement in the well-being of the poor is lower than would have been predicted by traditional analyses. Furthermore, sufficiently severe work-disincentive effects imply that a higher income-maintenance level can actually harm the poor.

In this context, consideration of labor-leisure choice is especially relevant to previous theoretical work on redistribution as a public good. When members of society care about the poor, economists such as Zeckhauser [1971] and Buchanan [1974] have concluded that redistribution to the poor will be underprovided in the absence of government intervention because of the free-riding problem. Implicit in this conclusion is the assumption that income-maintenance increases would help the poor -- if it is possible for these increases to harm the poor, it is impossible to say *a priori* whether redistribution would be underprovided or overprovided (from the point of the view of a recipient) in the absence of government intervention. Since labor-leisure choice lessens the marginal impact of redistribution on the welfare of the poor, a social planner who attempted to find the "optimal" level of income maintenance would overestimate the extent to which government-mandated redistribution should be employed. Further, if work-disincentive effects were sufficiently severe, it is

possible that a redistribution from recipients to workers would be a Pareto improvement.

In the third chapter, I examine the issue of benefit harmonization. Within the European Union, advocates of redistribution have suggested that income maintenance programs be "harmonized" (or at least that a floor be imposed) at the level of its most generous states in order to protect those members from the fiscal externalities associated with redistributive policy. To the extent that interstate welfare differentials cause high-benefit states to attract recipients and repel workers, it is feared that closer European integration will impose political pressure on high-benefit states to reduce their income maintenance levels [Sinn 1990]. Proponents of redistribution have supported their argument for centralization by citing previous work in the economics literature that suggests centralization would improve economic efficiency. In particular, there is a consensus in the fiscal federalism literature that a uniform level of income maintenance across a federation would necessarily improve the economic efficiency of that federation because such uniformity would eliminate the incentive for welfare-induced migration [Musgrave 1971, Oates 1968].

However, the efficiency properties of benefit harmonization are crucially dependent on the absence of labor-leisure effects in the theoretical models of the fiscal federalists. While it is true that a uniform income maintenance policy eliminates incentives for welfare-induced migration, it does not eliminate the work-disincentive effects of income maintenance programs. I examine the traditional framework and conclude that, in the absence of work-disincentive effects, a uniform increase in income maintenance programs will not harm economic efficiency. I then add labor-leisure effects to the model and find that, contrary to previous work, a uniform increase in income maintenance programs necessarily lowers

economic efficiency because it lowers the size of the labor force. Finally, I use these results to examine the transition from a system characterized by interstate differentials to a system with a uniform income maintenance level and I give conditions under which such a shift would raise or lower economic efficiency. In particular, I demonstrate that, for any set of income maintenance levels in a decentralized federation, there exists a unique uniform income maintenance level below which a shift to centralization would unambiguously increase economic efficiency.

This conclusion is important to public policy in both the European Union and the United States. With respect to the European Union, it cannot be stated *a priori* that a shift from the status quo to a uniform income maintenance level equal to that of Sweden would necessarily increase the economic efficiency of the E.U. -- while this might be the case (and while such a shift might be desirable because of equity considerations), an increase in economic efficiency cannot be guaranteed unless the shift is to British rather than Swedish levels. With respect to the United States, where Republicans have argued for decentralized redistribution on the ostensible grounds of "states' rights," it cannot be stated *a priori* that a shift from the status quo to decentralization would necessarily increase the economic efficiency of the U.S. -- while this might be the case (and while such a shift might be desirable on other grounds), an increase in economic efficiency cannot be guaranteed unless decentralization induces states to lower their income maintenance levels.

In the second and third chapters, I find that, in a world characterized by a number of theoretical assumptions, interstate income maintenance differentials will induce both migration and labor-leisure decisions on the part of citizens. With respect to both the welfare

of the poor and economic efficiency, the results of these chapters suggest that the public policy implications of previous work may have been overstated. In order for this conclusion to have empirical relevance, however, it must be the case that a qualitatively significant number of welfare recipients actually make migration and labor-leisure choices in response to these interstate differentials.

In the fourth chapter, I examine the extent to which interstate welfare differentials affect welfare recipiency in the United States. While a number of studies have sought to examine this issue [Moffit 1992, Cebula 1979], I improve upon these studies in several respects. First, past work generally employed extremely limited data sets that did not permit an analysis of intertemporal variation. Second, past work considered a smaller portion of the total welfare benefit package available to welfare recipients and did not correctly compensate for interactive effects between programs. Third, most examples of past work did not use a simultaneous-equations system even though welfare recipiency and benefit determination are each endogenous to the other. Finally, past work did not consider a number of administrative variables that affect both the welfare generosity of a state and the marginal cost of providing additional benefits.

I find mixed evidence on the importance of welfare generosity to welfare recipiency. On the one hand, the welfare benefit package exerts an insignificant effect on welfare recipiency. On the other hand, several variables related to welfare generosity, including the prevalance of welfare offices and the presence of a pregnancy subsidy, exert positive and significant effects on welfare recipiency. This finding suggests that the effect of welfare generosity on welfare recipiency is more complex than has been noted by previous work, and

it provides substantial (though not unambiguous) support for the real-world importance of welfare-induced migration and labor-leisure choice.

2 Migration and Labor-Leisure Choice in a Decentralized Federation

2.1 Introduction

When individuals are costlessly mobile across a system of jurisdictions, individuals will "vote with their feet" and reside in the jurisdiction whose attributes maximize their well-being [Tiebout 1956]. Economic theory suggests that differential redistributive policies within a federation will cause high-benefit jurisdictions to attract recipients and repel workers, and recent empirical work has confirmed the responsiveness of migration to redistributive policy [Brown and Oates 1987, Gramlich and Laren 1984, Moffitt 1992]. The fiscal externalities associated with decentralized redistribution imply that an increase in redistribution by one jurisdiction will affect poor individuals in all jurisdictions [Orr 1976]. In particular, previous work has concluded that such an increase necessarily helps the poor.

This consensus is especially important in light of the debate over redistribution as a public good. When members of society care about the poor, economists such as Zeckhauser [1971] and Buchanan [1974] have concluded that redistribution will be underprovided in the

absence of government intervention because of the free-riding problem. That is, although each potential contributor values the welfare of the poor, each has an incentive to refrain from personal sacrifice because the psychic gains from a single contribution to the poor benefit everyone but the monetary costs from a single contribution are borne by the contributor alone. In this situation, redistribution becomes a public good, and it is possible for an increase in redistribution to be a Pareto improvement [Hochman and Rodgers 1969].

The extent to which redistribution helps the poor is crucially dependent on the extent to which transfers to the poor generate work-disincentive effects. A number of empirical studies suggest that labor-leisure choice has a significant impact on the effectiveness of redistributive policies [Parsons 1980, Moffitt 1992]. When individuals may choose between leisure and labor, an increase in welfare benefits by one jurisdiction will increase the absolute number of poor in a federation as well as induce migration across jurisdictions, thereby lessening the marginal impact of redistribution on the true public good: the welfare of the poor. In particular, inclusion of work-disincentive effects implies that traditional work has understated the fiscal externalities associated with redistribution: migration is higher, economic efficiency is lower and the improvement in the well-being of the poor is lower than would have been predicted by traditional analyses. Furthermore, sufficiently severe work-disincentive effects imply that redistribution can harm the poor. When this is the case, redistribution becomes (at least at the margin) a public bad rather than a public good, and it is possible for a decrease in redistribution to achieve a Pareto improvement in social welfare.[1]

[1]There is an additional factor that, while ignored by previous work, is relevant to discussions of redistribution as a public good: the extent to which altruistic individuals value a smaller population of nonworkers as well as a higher income for nonworkers. An

The basic framework of the paper is as follows. The second section of the paper describes the economic model. The third section examines migratory responses to differential levels of redistribution in the context of common markets for labor and amenities when the decision to work is exogenous. In this section, we reach the standard conclusions of the "fiscal federalists" with an intriguing twist: the observed relationship between benefits and wages need not rely on altruism for its explanation. The fourth section extends the basic analysis through endogeneity of the labor-leisure decision. In this section, we demonstrate that traditional work systematically understates the costs of redistributive policy and overstates the benefits. We further show that it is possible for an increase in redistribution to harm its beneficiaries. The fifth section gives concluding thoughts.

2.2 A Description of the Model

In this paper, we examine redistribution in the context of a system of jurisdictions whose citizens migrate in order to maximize utility. Previous work in the migration literature has assumed that individuals differ in an exogenously given income parameter, and that these individuals migrate in response to differentials in the price of housing [e.g. Epple and Romer 1991]. A recent paper by Wildasin [1991], however, relaxes the exogenous-income assumption with one in which workers receive their marginal products. In the Wildasin

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altruism which valued both of these effects would only strengthen the argument given here.

framework, a number of jurisdictions share a common labor market within which income-maximizing individuals receive both welfare benefits and wages. Although this model provides a number of empirical insights, it is most appropriate for an analysis of local public goods because most workers do not receive welfare payments and most recipients do not work [Orr 1976]. Thus, an explicit attempt to model welfare benefits requires a different formulation.

When jurisdictions offer differential incomes to costlessly mobile individuals, the individuals will migrate until incomes are equalized.[2] In order for jurisdictional incomes to equilibrate, income must be congestible in the sense that, for each type of individual, an increase in the number of residents lowers jurisdictional income.[3] It is natural for labor markets to form the basis of this congestibility when all mobile individuals are employed. In a theoretical framework which incorporates both working and nonworking individuals, the exclusive use of labor markets to equilibrate individuals becomes problematic. If the poor do not respond to a common labor market, however, to what equilibrating mechanism do they respond?

We assume that both poor and employed individuals respond to market forces in the form of locational amenities. It is well known that amenities affect the migration decisions

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[2]As Wildasin [1992] notes, costless mobility is an increasingly realistic assumption due to advances in communications and transportation technology. In general, the qualitative conclusions of this paper hold when mobility is costly, although interjurisdictional differentials smaller than the cost of mobility would persist in equilibrium.

[3]If this were not the case, the system would equilibrate at a "corner solution" in which each type of mobile individual would reside in exactly one jurisdiction. Such a system would offer scant theoretical or empirical insight.

of individuals [Rosen 1979, Graves and Linneman 1979]. In fact, empirical work reveals that regional wage differentials are largely a function of amenities [Roback 1982]. A broad range of amenities are subject to congestion; examples include beaches, public parks, and even the crime rate, which increases with increasing population density.[4] Thus, a broadly defined measure of locational amenities satisfies a necessary condition for market equilibrium.

Although both poor and employed individuals respond to amenity differentials in the model, we assume that a poor individual will consume a greater quantity of amenities than an employed individual. This assumption need not rest upon any of the observed correlations between personal income and deleterious activities such as crime, although these effects would only accentuate the conclusions of this paper. We need only assume that individuals who work must sacrifice time that would otherwise have been used to consume amenities, or that poor individuals are likely to engage in a relatively intense consumption of amenities because they lack the money to purchase consumer goods. Without loss of generality, we normalize these congestion effects in relation to poor individuals.

There are two types of individuals in the model, employed and poor, who are costlessly mobile across a fixed number of jurisdictions.[5] Each jurisdiction is endowed with a Ricardian production function $f_i(e_i)$ for the numeraire commodity, where i is the jurisdiction

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[4]Although there are noncongestible amenities (such as temperature), we do not require that each component of the amenities function be congestible. It is only necessary that some portion of the amenities function be congestible, so that the level of amenities is downward sloping in population.

[5]Although we assume that all poor and employed individuals are mobile, such an assumption is not crucial for the analysis. It should be noted that, when some individuals are immobile, the implication of changes in welfare policy may differ considerably for mobile and immobile individuals.

of interest and e_i is the number of individuals who are employed in the jurisdiction.[6] This production function is monotonically increasing and concave in the number of employed individuals. Each jurisdiction is also endowed with an amenities function $a_i(p_i + \alpha e_i)$, where α is a scale factor less than unity and p_i is the number of individuals who reside in the jurisdiction but are not employed.[7] The amenities function is, at least at the margin, decreasing in its argument.

Employed individuals are endowed with one unit of labor which must be used to produce the numeraire commodity. Each employed individual receives from his employer the marginal value of labor in production of the numeraire, and no resident who is able to work may be excluded from employment. Poor individuals, on the other hand, receive subsidies from their local jurisdiction instead of wages from an employer. These subsidies are identical across all recipients in a given jurisdiction, and no resident who is poor may be excluded from the subsidy. Subsidies are provided by landlords, who are assumed to claim all residual profits and finance all redistribution; both the landlords and their capital are immobile.[8]

Let the benefit level paid to poor individuals from a given jurisdiction be denoted b_i. Then the net income of poor individuals in jurisdiction i is given by

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[6]The production function need not differ across jurisdictions. However, the model is completely general with regard to employer human capital and jurisdictional technology, both of which could generate interjurisdictional differences in the production function.

[7]The amenities function, like the production function, need not differ across jurisdictions.

[8]There is no requirement that residual profits equal redistributive outlays.

$$Y_i^P = b_i + a_i(p_i + \alpha e_i). \tag{1}$$

Suppose that the poor seek to maximize net income. Since the poor are costlessly mobile across jurisdictions, the equilibrium net income of the poor must be identical across all jurisdictions. In other words,

$$b_i + a_i(p_i + \alpha e_i) = b_j + a_j(p_j + \alpha e_j) \quad \forall\ i,j. \tag{2}$$

Denote this level of net income by Y^P.

Let the wage paid to employed individuals from a given jurisdiction be $f_i'(e_i)$. Then the net income of employed individuals is given by the expression

$$Y_i^E = f_i'(e_i) + a_i(p_i + \alpha e_i). \tag{3}$$

Suppose that the employed seek to maximize net income. Since the employed are costlessly mobile across jurisdictions, the equilibrium net income of the employed must be identical across jurisdictions. In other words,

$$f_i'(e_i) + a_i(p_i + \alpha e_i) = f_j'(e_j) + a_j(p_j + \alpha e_j) \quad \forall\ i,j. \tag{4}$$

Denote this level of net income by Y^E.

Finally, let M be the total number of mobile individuals in the system. Since these mobile individuals are divided into at most two types, it must be the case that

$$\sum p_i + \sum e_i = M. \tag{5}$$

When the decision to work is exogenous to the model, it is possible to write equations for each type of individual:

$$\sum p_i = P \tag{5a}$$

$$\sum e_i = E \tag{5b}$$

2.3 Comparative Statics and the Wage-Benefit Correlation

An examination of the traditional framework is instructive both for its confirmation of traditional conclusions and its application to an empirical regularity: the wage-benefit correlation. There is substantial evidence from the United States that the level of welfare benefits provided by a jurisdiction is correlated with the prevailing wage in that jurisdiction [Orr 1976]. Economists have generally explained this correlation through an appeal to altruism tempered by decreasing marginal utility of income [Gramlich and Laren 1984]. According to this explanation, a relatively high prevailing wage induces a relatively high welfare payment in a jurisdiction. In this section, we investigate the comparative statics of the system of jurisdictions and reach a dramatically different explanation for the wage-benefit correlation.

An increase in redistribution by jurisdiction i increases the net income of the poor in jurisdiction i. Since such a difference cannot persist in equilibrium, poor individuals must migrate from other jurisdictions to jurisdiction i. It is convenient to solve for the migration of employed individuals first. To determine the magnitude of this effect, we must first solve the system of equations characterized by (2) and (4). A joint implication of these equations is that the equilibrium income differential is equalized across jurisdictions. Therefore,

$$Y^E - Y^P = f_i'(e_i) - b_i = f_j'(e_j) - b_j \quad \forall\ i,j. \tag{6}$$

Using this equation, it is possible to solve implicitly for $e_i(Y^E - Y^P + b_i)$. The resulting functions are simply $f'^{-1}(Y^E - Y^P + b_i)$ and their derivatives must be negative because wages are decreasing

in e_i. Substituting each labor-demand equation into (5b), it is possible to solve for the net income differential as a function of benefit levels.

It can be shown by implicit differentiation of (5b) that

$$\frac{\partial(Y^E - Y^P)}{\partial b_i} = -\frac{e_i'}{\sum e_k'} \tag{7}$$

This derivative, which we shall denote by the symbol β_i, measures the marginal impact of a change in redistribution on the distribution of income. The migration of employed individuals induced by a change in b_i is given by

$$\frac{\partial e_i}{\partial b_i} = (1 + \beta_i)e_i' < 0 \tag{8a}$$

$$\frac{\partial e_j}{\partial b_i} = \beta_j e_i' > 0. \tag{8b}$$

These equations demonstrate the spillover effect for employed individuals: the equilibrium number of employed individuals is unambiguously lower in jurisdiction i and higher in all other jurisdictions.

In a similar manner, once the equilibrium effects on employed individuals are known, it is possible to solve for the equilibrium allocation of poor individuals. The change in net income for poor individuals is

$$\frac{\partial Y^P}{\partial b_i} = \frac{(a_i^{-1})'}{\sum (a_k^{-1})'} > 0. \tag{9}$$

This derivative, which we shall denote by the symbol π_i measures the marginal impact of a

change in redistribution on the net income of the poor. The migration of poor individuals induced by a change in b_i is given by

$$\frac{\partial p_i}{\partial b_i} = -(1-\pi_i)(a_i^{-1})' - \alpha(1+\beta_i)e_i' > 0 \tag{10a}$$

$$\frac{\partial p_j}{\partial b_i} = \pi_j(a_i^{-1})' - \alpha\beta_j e_i' < 0. \tag{10b}$$

These equations demonstrate the spillover effect for poor individuals: the equilibrium number of poor individuals is unambiguously higher in jurisdiction i and lower in all other jurisdictions.

These results permit a discussion of the aggregate effects of a change in b_i. A unilateral increase in benefits by jurisdiction i induces poor individuals to move from all other jurisdictions to jurisdiction i. Since every jurisdiction experiences a change in the number of resident poor, every jurisdiction experiences a change in the level of amenities available to employed individuals. In particular, the reduced level of amenities in jurisdiction i and the increased level of amenities in all other jurisdictions induce migration of employed individuals from jurisdiction i into all other jurisdictions. This migration continues until a new equilibrium is established. In this new equilibrium, the net income of the poor is unambiguously higher, although equation (9) demonstrates that the net income of the poor in jurisdiction i cannot increase by the full amount of the benefit increase.

The presence of a wage-benefit correlation follows directly from the conclusions of this section. By equation (6), the benefit level offered by a jurisdiction will be positively correlated with the wage in that jurisdiction. However, the wage-benefit correlation is due

to market forces rather than altruism. Causation is reversed from the traditional explanation: high benefit levels increase the scarcity of labor by "driving out" employed individuals, and it is this decrease in the number of employed individuals that increases the prevailing wage. Thus, the wage-benefit correlation need not rely on altruism for its explanation.

2.4 Labor-Leisure Effects and Pareto-Optimal Redistribution

In the previous section, we have considered a model in which the decision to work is exogenous. However, there is reason to believe that the labor-leisure decision is an important component of the equilibrium behavior of mobile individuals. Economic theory suggests that, by lowering the relative price of leisure, an increase in redistribution will induce individuals to choose leisure over labor, and empirical work has confirmed the existence of this effect [Blank 1988, Treyz et al. 1993]. In this section, we investigate the additional implications of a benefit increase that occur when the decision to work is endogenous and we discover that the severity of spillover effects is unambiguously greater. We further discover that, under certain conditions, an increase in welfare benefits unambiguously worsens the welfare of the poor.

Suppose there are a fixed number of mobile individuals, M, who are costlessly mobile across types as well as jurisdictions. Let each individual receive some disutility from work,

and represent these disutility values by v^I.[9] Mobile individuals are assumed to compare the net income differential between the employed and the poor with their disutility value, and to work if and only if the differential exceeds their aversion for work. That is, a given individual with disutility value v^I will choose to work if and only if

$$Y^E - Y^P > v^I. \tag{11}$$

The number of poor individuals in the system of jurisdictions, $P(Y^E - Y^P)$, is given by an examination of (11) for all mobile individuals.

Suppose that, after interjurisdictional migration in response to a benefit increase establishes an equilibrium, individuals may choose between labor and leisure. The following equations describe the equilibrium changes that would result from an infinitesimal shift from labor to leisure:

$$\frac{\partial p_j}{\partial P} = \pi_j(1-\alpha) - \alpha\beta_j > 0 \tag{12}$$

$$\frac{\partial e_j}{\partial P} = \beta_j < 0 \tag{13}$$

$$\frac{\partial Y^P}{\partial P} = \frac{(1-\alpha)}{\sum (a_k^{-1})'} < 0 \tag{14}$$

$$\frac{\partial (Y^E - Y^P)}{\partial P} = -\frac{1}{\sum (e_k')} > 0. \tag{15}$$

These comparative statics may be employed to obtain the independent effect of labor-leisure

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[9]Note that the disutility value of an individual need not be a reflection of his "work ethic" if individuals differ in ways that are irrelevant to the production process but relevant in other respects. For example, if a single parent places a relatively high value on free time or a member of a minority group faces discrimination in the workplace, these individuals are likely to have high disutility values.

choice on the equilibrium results of the previous section. Given $P(Y^E - Y^P)$, it can be shown that

$$\frac{\partial P}{\partial b_i} = -\frac{e_i' P'}{P' + \sum e_k'} . \tag{16}$$

Therefore, independent effects are given by the following set of equations:

$$\left(\frac{\partial p_j}{\partial P}\right)\left(\frac{\partial P}{\partial b_i}\right) = -[(1-\alpha)\pi_j - \alpha\beta_j]e_i' L^* > 0 \tag{17}$$

$$\left(\frac{\partial e_j}{\partial P}\right)\left(\frac{\partial P}{\partial b_i}\right) = -\beta_j e_i' L^* < 0 \tag{18}$$

$$\left(\frac{\partial Y^P}{\partial P}\right)\left(\frac{\partial P}{\partial b_i}\right) = -\frac{(1-\alpha)e_i' L^*}{\sum (a_k^{-1})'} < 0 \tag{19}$$

$$\left(\frac{\partial (Y^E - Y^P)}{\partial P}\right)\left(\frac{\partial P}{\partial b_i}\right) = -\beta_i L^* > 0 \tag{20}$$

where

$$L^* = \frac{P'}{P' + \sum e_k'}$$

will be referred to subsequently as the *coefficient of leisure* because of its relationship to the supply of labor.

The interpretation of these comparative statics yields the result that labor-leisure endogeneity worsens spillover effects for all jurisdictions. These effects include an increase in the number of poor individuals in each jurisdiction, a decrease in the number of employed individuals in each jurisdiction, a decrease in the welfare of the poor, an increase in the wage

rate, and an increase in the net income differential between employed and poor.[10] Thus, previous work that ignores labor-leisure choice is likely to understate the fiscal externalities associated with redistribution and thereby overstate the beneficial effects of redistribution. The extent to which previous work understates fiscal externalities is relatively severe when the labor demand curve in jurisdiction *i* is elastic and a large number of employed individuals barely prefer work in the absence of a benefit increase.

Combining the migration and work-disincentive effects yield the following total derivatives, which describe the overall effects of an increase in redistribution by jurisdiction *i*:

$$\frac{dp_i}{db_i} = -\alpha e_i'(1+\beta_i-\beta_i L_*)-(a_i^{-1})'(1-\pi_i)-(1-\alpha)\pi_i e_i' L_* > 0 \tag{21a}$$

$$\frac{dp_j}{db_i} = -\alpha \beta_j e_i'(1-L_*)+(a_j^{-1})'\pi_i-(1-\alpha)\pi_i e_i' L_* > \frac{\partial p_j}{\partial b_i} \tag{21b}$$

$$\frac{\partial e_i}{\partial b_i} < \frac{de_i}{db_i} = [1+\beta_i(1-L_*)]e_i' < 0 \tag{22a}$$

$$\frac{\partial e_j}{\partial b_i} > \frac{de_j}{db_i} = \beta_j e_i'(1-L_*) > 0 \tag{22b}$$

$$\frac{dY^P}{db_i} = \pi_i - \frac{(1-\alpha)e_i' L_*}{\sum (a_k^{-1})'} < \frac{\partial Y^P}{\partial b_i} \tag{23}$$

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[10]If workers with high disutility values are concentrated in certain jurisdictions, compensatory worker migration into those jurisdictions may be necessary to achieve equilibrium. The function $P(Y^E-Y^P)$ combines these effects, thereby masking the degree to which compensatory migration occurs. However, a separation of the two effects is not relevant for this analysis.

$$\frac{\partial(Y^E - Y^P)}{\partial b_i} < \frac{d(Y^E - Y^P)}{db_i} = \beta_i(1 - L_*) < 0 \tag{24}$$

$$\frac{dY^E}{db_i} = \pi_i + \beta_i(1 - L_*) - \frac{(1-\alpha)e_i'}{\sum (a_k^{-1'})} . \tag{25}$$

These comparative statics illustrate the extent to which work-disincentive effects mitigate the conclusions of traditional work in the migration literature. In general, fiscal externalities are worsened by the inclusion of labor-leisure choice.

Equation (23) reveals an important implication of labor-leisure endogeneity: when labor-supply effects are sufficiently severe, it is possible for the marginal loss of amenities induced by labor-supply changes to exceed the marginal benefit to the poor from the additional redistribution. In other words, it is possible for an increase in redistribution by jurisdiction ***i*** to harm the poor. This phenomenon, which we shall call the *New York City effect*, is difficult to identify through empirical observation because the most easily observable components of utility (benefits and wages) are unambiguously higher when the effect occurs. The nomenclature for this effect stems from the "paradox" that has been noted by a number of New York observers: during the last half-century, both welfare benefits and wages have risen dramatically, yet most New Yorkers believe that their standard of living has declined [Glazer 1990]. The results of this paper illustrate the economic possibility of such an outcome, and also provide an interesting contrast to the results of Hochman and Rodgers [1969] and Brennan [1973] on Pareto-optimal redistribution. Taken together, these researchers show that there are a variety of circumstances under which an increase in

redistribution can benefit everyone. However, a comparison of equations (23) and (25) reveals that employed individuals always reap fewer gains from redistribution than the poor. Since it is possible for an increase in redistribution to worsen the welfare of the poor, it is possible for a reduction in redistribution to be Pareto-improving.

While this result may appear counterintuitive, it is in many respects similar to recent work on congestible facilities. For example, Glazer and Konrad [1993] find that, when poor individuals contribute to the congestion of a public facility but rich individuals do not, it is possible that an income transfer from the poor to the rich would increase the welfare of the poor. While the model given here supposes congestion effects by both the poor and the employed, the qualitative result of Glazer and Konrad holds because the poor contribute disproportionately to the congestion of amenities. When the New York City effect would occur, a reduction in benefits is equivalent to a Glazer-Konrad transfer, and such a transfer would increase the welfare of the poor.

The implications of this result actually extend beyond the possibility that redistribution can harm its beneficiaries. Zeckhauser [1971] has argued that, when citizens care about the welfare of the poor, redistribution will be underprovided in the absence of government intervention because of the free-riding problem. While this conclusion provides important insights into the nature of redistribution, it need not apply when redistribution would harm the poor. Indeed, if Andreoni [1989] and Thurow [1971] are correct in their assertion that those who donate to the poor are partially motivated by the act of giving, voluntary transfers might occur even when the transfers worsen the welfare of the poor. In this situation, voluntary transfers to the poor would be too high rather than too low in the absence of

government intervention, and government provision of redistributive benefits might exacerbate rather than mitigate the "market failure" associated with redistribution.

2.5 Conclusion

In this paper, we have examined the effects of redistributive policy on the welfare of its citizens. We have relaxed several common assumptions of the migration literature, including fixed wages for employees, fixed marginal effects of redistribution on the welfare of the poor, and the absence of labor-leisure choice. We have shown that previous work systematically understates the magnitude of redistribution-induced spillovers and overstates the extent to which redistribution raises the net income of the poor. We have also shown that altruism does not cause the wage-benefit correlation and need not imply support for redistribution when redistribution induces a portion of the workforce to choose leisure over labor. Finally, we have shown that it is possible for a reduction in transfer payments to the poor to represent a Pareto improvement in welfare.

In the model, redistribution is funded by absentee landlords rather than workers. While real-world workers undoubtedly contribute to redistributive programs, such a contribution would only accentuate the conclusions of this paper. It is of course possible to impose a proportional tax on wages, but such a device would contribute scant theoretical insight into redistributive policy and would not alter any of the qualitative results. If workers in each jurisdiction actually paid for all redistribution within their jurisdictions, workers would

face more powerful incentives to move away from concentrations of poor individuals and to exit the labor force. Both of these effects would worsen the fiscal externalities associated with redistribution.

From a public policy perspective, it is important to emphasize what this paper has (and has not) shown. We have shown that previous work has overstated the benefits and understated the costs of redistribution, which suggests that policymakers may have engaged in a superoptimal amount of redistribution. We have also shown that it is possible for an increase in redistributive benefits to worsen the welfare of the poor, which suggests that a reduction in benefits by one jurisdiction might increase the welfare of all citizens. We have not, however, demonstrated that real-world states ought to reduce their redistributive benefits, nor have we demonstrated that any real-world state would actually improve the welfare of the poor through a reduction in redistribution. Furthermore, the theoretical results of this paper are (like any work of theory) dependent on theoretical assumptions which cannot capture the full complexities of real-world economies. For all of these reasons, the results of this paper should not be taken as a policy prescription to reduce or eliminate redistributive benefits from all real-world federations. It does, however, appear that the magnitude of work-disincentive effects is of crucial importance to normative analyses of redistribution, and the conclusions of this paper call for a renewed examination of these effects by political decisionmakers.

Appendix

Proof of Result (7):

Implicitly differentiating (5a) with respect to b_i, we have

$$\frac{\partial E}{\partial b_i} = \frac{\partial \sum e_k}{\partial b_i}.$$

Since E is fixed,

$$0 = \frac{\partial \sum e_k}{\partial b_i}$$

$$0 = \frac{\partial [e_i + \sum_{k \neq i} e_k]}{\partial b_i}$$

$$0 = e_i' \frac{\partial [Y^E - Y^P + b_i]}{\partial b_i} + \sum_{k \neq i} e_k' \frac{\partial [Y^E - Y^P + b_k]}{\partial} b_i$$

$$0 = e_i' + \frac{\partial [Y^E - Y^P]}{\partial b_i} \sum e_k'$$

Rearranging terms, we obtain

$$\frac{\partial [Y^E - Y^P]}{\partial b_i} = -\frac{e_i'}{\sum e_k'} = \beta_i$$

which is the desired result. □

Proof of Result (9):

Since $Y^P - b_i + a_i(p_i + \alpha e_i)$, it must be the case that $p_i + \alpha e_i - a_i^{-1}(Y^P - b_i)$.

Implicitly differentiating (5) with respect to b_i yields

$$\frac{\partial(P + \alpha E)}{\partial b_i} = \frac{\partial \sum a_k^{-1}}{\partial b_i}.$$

Since P, α and E are fixed,

$$\begin{aligned} 0 &= \frac{\partial \sum a_k^{-1}}{\partial b_i} \\ &= \frac{\partial\left(a_i^{-1} + \sum_{k \neq i} a_k^{-1}\right)}{\partial b_i} \\ &= a_i^{-1}\left(\frac{\partial Y^P}{\partial b_i} - 1\right) + \left(\frac{\partial Y^P}{\partial b_i}\right)\sum_{k \neq i} a_k^{-1} \\ &= \left(\frac{\partial Y^P}{\partial b_i}\right)\sum a_k^{-1'} - a_i^{-1'}. \end{aligned}$$

Therefore, it must be the case that

$$\frac{\partial Y^P}{\partial b_i} = \frac{a_i^{-1'}}{\sum a_k^{-1'}} = \pi_i$$

which proves the result. □

Proof of Result (16):

Let W be the change in $(Y^E - Y^P)$ that occurs as a result of the influx of new poor.

Since

$$\frac{\partial(Y^E - Y^P)}{\partial P} = -\frac{1}{\sum e_k'}$$

and the change in $(Y^E - Y^P)$ that results from interjurisdictional migration is β_i, it must be the case that

$$-W\sum e_k' = -P'(\beta_i - W)$$

in equilibrium. This equation may be simplified to

$$W\left(P' + \sum e_k'\right) = P'\beta_i$$

or

$$W = \frac{\beta_i P'}{P' + \sum e_k'}.$$

The change in P is given by

$$\frac{\partial P}{\partial b_i} = -P'(\beta_i - W)$$

$$= -P'\left(\frac{\beta_i \sum e_k'}{P' + \sum e_k'}\right).$$

Therefore, we have

$$\frac{\partial P}{\partial b_i} = -\frac{e_i' P'}{P' + \sum e_k'}$$

which is the desired result. □

3 Benefit Harmonization and Economic Efficiency: Lessons for the European Union

3.1 Introduction

Within the European Union, advocates of redistribution have suggested that benefits be "harmonized" (or at least that a floor be imposed) at the level of its most generous states in order to protect those members from the fiscal externalities associated with redistribution. To the extent that interstate welfare differential cause high-benefit states to attract recipients and repel workers, it appears likely that a "common market" in Europe would yield greater benefits to nations with low levels of redistribution; worse, it is feared that these pressures would encourage the more "progressive" members of the EU to lower their benefits [Sinn 1990]. To a European Union whose leaders support high levels of redistribution, such pressures are anathema.[1]

Traditional economic analysis suggests that redistribution should be performed by a central government rather than by decentralized jurisdictions. Economists such as Musgrave

[1]As Emerson [1991] notes, collective arrangements such as the Social Charter have been designed by EU leaders to mitigate these competitive pressures.

[1971] and Oates [1968] have noted that a central government could impose equal levels of redistribution across all jurisdictions, thereby eliminating the interjurisdictional differential that induce migration. In effect, centralized redistribution can transform a system of jurisdictions into a single jurisdiction from which mobile individuals cannot escape. Advocates of benefit harmonization have concluded from this finding that benefit harmonization will not produce economic inefficiencies regardless of the level at which benefits are harmonized.

The efficiency properties of centralized redistribution are critically dependent on the absence of any labor-supply effects of redistributive policy. Previous work in the migration literature is virtually silent on the subject of labor-leisure choice, although a substantial amount of empirical evidence suggests that work-disincentive effects are relevant in employment decisions [Parsons 1980, Moffitt 1992]. Endogeneity of the labor-leisure decision can have significant effects on equilibrium outcomes because an increase in welfare benefits by one jurisdictions might increase the absolute number of poor as well as induce migration across jurisdictions. Even a central government is vulnerable to these effects; although workers/recipients cannot escape a central government's redistributive policy through migration, it is possible for them to choose leisure over labor. For this reason, endogeneity of the labor-leisure decision permits an analysis of redistributive externalities that traditional analyses fail to capture.

The paper is organized as follows. The second section of the paper describes the basic model. The third section examines migratory responses to differential levels of redistribution in the context of common markets for labor and amenities when the decision to work is exogenous. In this section, we confirm the traditional result that uniform changes in

redistributive policy do not produce fiscal externalities. The fourth section extends the basic analysis to incorporate the work-disincentive effects of redistributive policy. In this section, we demonstrate that uniform changes in redistribution are not sufficient to achieve economic efficiency because such changes affect the output of the federation. The fifth section applies the analysis to a transition from decentralization to centralization. In this section, we show that a move from decentralization to centralization need not enhance economic efficiency. We also define a centralized equivalent to any decentralized set of benefits and give conditions under which movement from decentralization to centralization increases or decreases economic efficiency. The final section gives concluding thoughts. In this section, we apply the conclusions of the paper to the European Union.

3.2 The Theoretical Framework

This chapter examines the extent to which centralized redistribution enhances economic efficiency. There are two types of individuals in the theoretical framework, employed and poor, who are costlessly mobile across a fixed number of jurisdictions that belong to a federation.[2] There are also two types of government, jurisdictional and central,

[2]Although we assume that all poor and employed individuals are mobile, such an assumption is not crucial for the analysis. It should be noted that, when some individuals are immobile, the implication of changes in welfare policy may differ considerably for mobile and immobile individuals.

each of which is empowered to offer subsidies to unemployed individuals.[3] Each jurisdiction is endowed with a Ricardian production function $f_i(e_i)$ for the numeraire commodity, where i is the jurisdiction of interest and e_i is the number of individuals who are employed in the jurisdiction.[4] This production function is monotonically increasing and concave in the number of employed individuals. Each jurisdiction is also endowed with an amenities function $a_i(p_i + \alpha e_i)$, where α is a scale factor less than or equal to unity and p_i is the number of individuals who reside in the jurisdiction but are not employed. The amenities function is, at least at the margin, decreasing in its argument.[5]

Employed individuals are endowed with one unit of labor which must be used to produce the numeraire commodity. Each employed individual receives from his employer the marginal value of labor in production of the numeraire, and no resident who is able to work may be excluded from employment. The tax burden borne by each employed individual is given by the sum of a federal wage tax, which is identical across jurisdictions, and a jurisdictional wage tax that can differ across jurisdictions. The rate at which these taxes are assessed is invariant to changes in redistributive policy, although aggregate revenue from taxation will vary because policy changes affect the wage rate. Formally, the net income of

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[3]This formulation permits an analysis of benefit floors as well as benefit harmonization. Since harmonization is a special case in which all jurisdictional benefits are equal, conclusions under the more general framework apply to analyses of harmonization.

[4]The production function need not differ across jurisdictions. However, the model is completely general with regard to employer human capital and jurisdictional technology, both of which could generate interjurisdictional differences in the production function.

[5]The importance of amenities in the migration decision is demonstrated by Rosen [1979] and Roback [1982].

employed individuals in jurisdiction i is given by

$$Y_i^E = [1-t^s-t^n]f_i'(e_i) + a_i(p_i+\alpha e_i) \quad (1)$$

where t^s denotes the jurisdictional (state) tax, t^n denotes the federal (national) tax and $f_i'(e_i)$ denotes the marginal productivity of labor. Hereafter, we shall for the sake of expositional simplicity subsume (except where explicitly noted) the tax coefficients into the wage expression.

Poor individuals choose to surrender their endowment of labor in exchange for subsidies from their local jurisdiction and the federal government. Local subsidies are identical across all recipients in a given jurisdiction; no unemployed resident of a jurisdiction may be excluded from its subsidy and no jurisdiction may offer subsidies to residents of any other jurisdiction. The federal subsidy is identical across all unemployed individuals in the federation, and no unemployed individual may be excluded from this subsidy. The poor pay no taxes; any budget shortfall is financed by immobile factory owners, who are assumed to claim the profits of the production process. Formally, the net income of poor individuals in jurisdiction i is given by

$$Y_i^P = b_i + g + a_i(p_i+\alpha e_i) \quad (2)$$

where b_i is the jurisdictional subsidy and g is the federal subsidy.

Since employed individuals are costlessly mobile, it must be the case that

$$f_i'(e_i) + a_i(p_i+\alpha e_i) = f_j'(e_j) + a_j(p_j+\alpha e_j) \quad \forall\ i,j. \quad (3)$$

The set of equations given by (3) gives the net income of an employed individual in any jurisdiction, which we shall denote by Y^E. Similarly, it must be the case that

$$b_i + g + a_i(p_i+\alpha e_i) = b_j + g + a_j(p_j+\alpha e_j) \quad \forall\ i,j. \quad (4)$$

This set of equations gives the net income of a poor individual in any jurisdictiction, which we shall denote by Y^P.

Finally, let M be the total number of mobile individuals in the system. Since these mobile individuals are divided into at most two types, it must be the case that

$$\sum p_i + \sum e_i = M. \tag{5}$$

When the decision to work is exogenous to the model, it is possible to write equations for each type of individual:

$$\sum p_i = P \tag{5a}$$

$$\sum e_i = E. \tag{5b}$$

3.3 Traditional Results

In the traditional framework, rent-seeking behavior by individuals in response to benefit differentials causes externalities that hinder the ability of any single jurisdiction to increase the welfare of its poor. In this section, we confirm the traditional result that a change in redistributive policy by a single jurisdiction will always generate fiscal externalities. We also show that a uniform change in redistributive policy across all jurisdictions will never generate such externalities.

When jurisdiction i chooses to increase its subsidy to the poor, the net income of the poor in jurisdiction i rises above that of the poor in other jurisdictions. Since such a difference cannot persist in equilibrium, poor individuals must migrate from other jurisdictions

to jurisdiction *i*. However, this migration will affect the level of amenities offered by each jurisdiction, which will in turn induce migration by employed individuals. Equations (3) and (4) jointly imply that the equilibrium income differential between the employed and the poor will be equalized across jurisdictions; that is,

$$Y^E - Y^P = f_i'(e_i) - b_i - g = f_j'(e_j) - b_j - g \quad \forall\ i,j. \tag{6}$$

Using this equation, it is possible to solve implicitly for $e_i(Y^E - Y^P + b_i + g)$. The resulting functions are simply $f^{-1}(Y^E - Y^P + b_i + g)$ and their derivatives must be negative because wages are decreasing in the number of employed individuals.

An examination of the employment functions derived from (6) reveals that, by application of the chain rule, the sign of their derivatives cannot be determined without an examination of the derivative of $(Y^E - Y^P)$ with respect to a change in b_i. Implicit differentiation of (5b) reveals that the change in the distribution of income resulting from a small change in the jurisdictional benefit level is given by

$$\frac{\partial(Y^E - Y^P)}{\partial b_i} = -\frac{e_i'}{\sum e_k'}. \tag{7}$$

This derivative, which we shall denote by the symbol β_i, is always positive and always less than one. Then the migration of employed individuals induced by a change in b_i is

$$\frac{\partial e_i}{\partial b_i} = (1 + \beta_i)e_i' < 0 \tag{8a}$$

$$\frac{\partial e_j}{\partial b_i} = \beta_j e_i' > 0 \tag{8b}$$

and the spillover effect for employed individuals is unambiguous: a jurisdiction that chooses to increase its subsidy will lose workers and cause every other jurisdiction to gain workers.

In a similar manner, once the equilibrium effects on employed individuals are known, it is possible to solve for the equilibrium allocation of poor individuals. The change in net income for poor individuals resulting from a small change in the jurisdictional subsidy is given by

$$\frac{\partial Y^P}{\partial b_i} = \frac{(a_i^{-1})'}{\sum (a_k^{-1})'} > 0, \tag{9}$$

and we shall denote this derivative by the symbol π_i. The migration of poor individuals induced by a change in b_i is therefore

$$\frac{\partial p_i}{\partial b_i} = -(1-\pi_i)(a_i^{-1})' - \alpha(1+\beta_i)e_i' > 0 \tag{10a}$$

$$\frac{\partial p_j}{\partial b_i} = \pi_j(a_i^{-1})' - \alpha\beta_j e_i' < 0, \tag{10b}$$

and the spillover effect for poor individuals is similarly unambiguous: a jurisdiction that choose to increase its subsidy will gain poor individuals and cause every other jurisdiction to lose poor individuals.

These results contrast sharply with those that result from an increase in the systemwide subsidy, g. The relevant changes in net income become

$$\frac{\partial(Y^E - Y^P)}{\partial g} = -\frac{\sum e_k'}{\sum e_k'} = -1 \tag{11}$$

$$\frac{\partial Y^P}{\partial g} = \frac{\sum (a_k^{-1})^{\gamma}}{\sum (a_k^{-1})^{\gamma}} = 1. \tag{12}$$

These results, when inserted into equations (8) and (10), reveal that neither employed nor poor individuals choose to migrate in response to the increase in g. Thus, uniform changes in redistributive policy will not (in the absence of labor-leisure choice) generate fiscal externalities.

3.4: How Work-Disincentive Effects Alter Traditional Conclusions

Economic theory suggests that an increase in redistribution will induce individuals to choose leisure over labor (provided leisure is a normal good) because such an increase lowers the relative price of leisure. A significant amount of empirical work suggests that subsidies to unemployed individuals produce work-disincentive effects [Moffitt 1992, Blank 1988]. We have already shown that, in the absence of work-disincentive effects, uniform changes in redistributive policy do not impede economic efficiency. In this section, we demonstrate that this conclusion does not hold when individuals are free to choose between leisure and labor. In particular, work-disincentive effects guarantee that changes redistributive policy will change the size of the labor force and thereby affect economic efficiency.

In order to introduce work-disincentive effects into the model, suppose that each mobile individual receives some disutility from work. These disutility values may (but need

not) reflect the underlying "work ethic" of each individual.[6] In choosing between leisure and labor, each individual will compare his disutility value with the marginal benefit from employment and will choose to work if and only if the marginal benefit exceeds his disutility value. That is, a given individual with disutility value v^I will choose to work if and only if

$$Y^E - Y^P > v^I. \tag{13}$$

The number of poor individuals in the system of jurisdictions, $P(Y^E - Y^P)$, is given by an examination of (13) for all mobile individuals.

Consider a change in redistributive policy by either the federal government or a single jurisdiction. We suppose that, once interjurisdictional migration establishes an equilibrium, individuals are free to choose between leisure and labor and then migrate in response to those choices.[7] Two separate effects are relevant to the analysis: the equilibrium changes that would result from an infinitesimal shift from labor to leisure (common to either a jurisdictional or a uniform shift in redistributive policy) and the magnitude of the labor-leisure effect. The changes with respect to a small change in the number of unemployed individuals are

$$\frac{\partial p_j}{\partial P} = \pi_j(1-\alpha) - \alpha\beta_j > 0 \tag{14}$$

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[6]The disutility value of an individual might also reflect traits that are irrelevant to the production process but relevant in other respects. For example, a single parent might place a relatively high value on "leisure" in order to care for her children, and a member of a minority group might place a relatively low value on "labor" if he would suffer discrimination in the workplace.

[7]This assumption facilitates the independent analysis of labor-leisure effects and does not entail any loss of generality.

$$\frac{\partial e_j}{\partial P} = \beta_j < 0 \tag{15}$$

$$\frac{\partial Y^P}{\partial P} = \frac{(1-\alpha)}{\sum (a_k^{-1})'} < 0 \tag{16}$$

$$\frac{\partial (Y^E - Y^P)}{\partial P} = -\frac{1}{\sum (e_k')} > 0 \tag{17}$$

and the magnitude of the labor-leisure effect is given by

$$\frac{\partial P}{\partial b_i} = -\frac{e_i' P'}{P' - \sum e_k'} > 0 \tag{18}$$

and

$$\frac{\partial P}{\partial g} = \frac{P'}{P' - \sum e_k'} > \frac{\partial P}{\partial b_i} > 0. \tag{19}$$

Application of the chain rule to these equations demonstrates that work-disincentive effects unambiguously worsen the spillover effects of the previous section. In particular, the number of unemployed individuals is unambiguously higher (and the size of the workforce unambiguously lower) than would have been predicted by the traditional framework. Thus, previous work that ignores labor-leisure choice suffers from a systematic bias that lessens the efficiency-impeding effects of redistribution. The extent to which previous work understates the fiscal externalities associated with redistribution is especially severe when a substantial portion of the workforce is almost indifferent between leisure and labor before the change in redistributive policy.

The comparative statics of this section reveal that work-disincentive effects will in

general occur whenever either the entire federation or a single jurisdiction adjusts its redistributive policy. However, a comparison of equations (18) and (19) demonstrates that the work-disincentive effects induced by a change in redistributive policy are unambiguously greater when the change occurs across all jurisdictions. This need not imply that the total externalities associated with policy changes will be greater under a uniform increase in redistribution, though it does illustrate the importance of labor-leisure choice in models of redistribution. Changes in a benefit floor or changes in a harmonized benefit level will generate externalities despite the fact that these changes do not create interjurisdictional differentials, and it is in fact possible for these externalities to exceed those of decentralized redistribution.

3.5 Benefit Harmonization and Output Maximization

Perhaps the most common policy prescription in the fiscal federalism literature is for a central government to impose a uniform level of redistribution across jurisdictions [Peterson and Rom 1990]. In general, previous work has concluded that centralized redistribution eliminates spillovers and induces economic efficiency [Buchanan 1950, Wildasin 1991].[8] Advocates of redistribution have used these conclusions to argue both for centralization and for increased subsidies to the poor [Sinn 1990]. However, we have shown

[8]In this paper, "centralized redistribution" is equivalent to the presence of a common benefit level across jurisdictions. Thus, the analysis applies to both coordinated and centralized redistribution.

that the inclusion of labor-leisure choice eliminates the optimality properties of centralized redistribution. In particular, when mobile individuals may choose between labor and leisure, a simultaneous increase in benefits to the poor will affect economic efficiency even though traditional analyses predict otherwise.

The presence of spillovers under centralized redistribution illustrates the inadequacy of traditional concepts of economic efficiency in the migration literature as applied to redistribution. In brief, traditional work in the migration literature postulates that economic efficiency is achieved when the marginal product of each factor is equalized across jurisdictions. When workers are the sole factor of production and receive their marginal product, optimal factor allocation implies that wages must be equalized across jurisdictions. Since differential welfare benefits distort the locational decisions of workers, optimal factor allocation also implies that benefit levels be equalized across jurisdictions. Thus, economic efficiency is achieved whenever each jurisdiction offers the same redistributive policy.

With the inclusion of labor-leisure choice, marginal factor product equalization no longer suffices to guarantee economic efficiency. In the framework of this paper, marginal factor product equalization implies amenity level equalization, which in turn implies benefit level equalization. Therefore, identical redistributive policies across jurisdictions is a necessary and sufficient condition the equalization of marginal factor products. However, identical policies cannot guarantee economic efficiency because the level at which the subsidy to poor individuals is set affects the supply of labor and hence national output. It is useful to label the equalization of marginal factor products as *allocative efficiency* in order to distinguish factor product equalization from the broader issue of output maximization.

Consider a federation in which subsidies (and tax rates) have been harmonized. We have shown that any such federation satisfies allocative efficiency, so there is no alternative spatial distribution of labor that would increase national output. However, the size of the labor force is related to the level at which subsidies are harmonized: relatively high subsidies will induce a relatively high number of individuals to choose leisure over labor and relatively low subsidies will induce a relatively high number of individuals to choose labor over leisure. The highest level of national output is therefore achieved when all jurisdictions refrain from redistribution. As long as every individual has a finite disutility value, there is also some level of redistribution above which the lowest level of national output (zero) is achieved.

Now, consider a federation in which subsidies (but not tax rates) differ across jurisdictions. Since it is possible to obtain any feasible amount of national output through a uniform subsidy, any vector of (nonharmonized) jurisdictional subsidies b^* for which national output is positive has a *centralized equivalent*, g^*, which would produce equal national output. Furthermore, the size of the labor force will always be smaller under g^* than under b^* because g^* satisfies allocative efficiency. Thus, a transition from b^* to any uniform benefit level less than g^* would increase economic efficiency and a transition from b^* to any uniform benefit level greater than g^* would decrease economic efficiency.

The centralized equivalent describes the set of uniform benefit levels under which a transition from decentralization to benefit harmonization would increase economic efficiency. While it would be desirable to determine the magnitude of the centralized equivalent relative to (for example) the median benefit offered by its decentralized counterpart, it is not in general possible to determine such a result. However, it is possible to compare the

equilibrium induced by a set of differential benefits and a harmonized equilibrium whose benefit level is equal to the minimum pre-harmonization benefit. Denote the set of differential benefits by b^* and the minimum pre-harmonization benefit by b_{MIN}. If it can be shown that a benefit increase by any single jurisdiction necessarily reduces the size of the labor force, it must be the case that a system of jurisdictions that offers a benefit vector b^* would increase its output by undergoing a "downward harmonization" to the level offered by the least generous member of the federation. Similarly, such a finding would demonstrate that an "upward harmonization" to the level offered by the most generous member of the federation must reduce its output.

Using the chain rule on the comparative statics of the previous section, we obtain

$$\frac{dp_i}{db_i} = -\alpha e_i'(1+\beta_i-\beta_i L^*)-(a_i^{-1})'(1-\pi_i)-(1-\alpha)\pi_i e_i' L^* > 0 \qquad (20a)$$

$$\frac{dp_j}{db_i} = -\alpha \beta_j e_i'(1-L^*)+(a_j^{-1})'\pi_i-(1-\alpha)\pi_i e_i' L^* > \frac{\partial p_j}{\partial b_i} \qquad (20b)$$

where

$$L^* = \frac{P'}{P'+\sum e_k'}$$

summarizes the labor-supply effects of redistributive policy and is an increasing function of labor supply elasticity. Summing equations (20a) and (20b) over all jurisdictions, we obtain the number of individuals who exit the labor force as a response to the change in benefits,

$$\frac{dP}{db_i} = \alpha(1-L^*)e_i' - \alpha e_i' - N(1-\alpha)\pi_i e_i' L^* > 0. \qquad (21)$$

Equation (21) demonstrates that a more generous redistributive policy by a single jurisdiction unambiguously decreases the size of the labor force within the federation. Since each element of the vector b^* is greater than or equal to the corresponding element of the vector b_{MIN}, the labor force of the federation is necessarily smaller under b^* than under b_{MIN}, and since b_{MIN} satisfies allocative efficiency, economic efficiency is unambiguously greater under b_{MIN} than b^*.

These results raise substantial doubts about the wisdom of benefit harmonization in the European Union. It has been proposed that benefits among the member states of the European Union be harmonized at the level of its most generous member, and a number of economists have contended that such an "upward harmonization" would not harm economic efficiency. However, we have shown that there exists some harmonized benefit level above which the transition to harmonization will unambiguously harm economic efficiency, which suggests the possibility that the efficiency gains associated with an upward harmonization have been overstated. Furthermore, although the economic ramifications of an upward harmonization are open to question, we have shown that a "downward harmonization" of redistributive policies to those of the least generous member of the federation would unambiguously increase the economic efficiency of the federation. This conclusion does not by itself imply that the European Union should engage in such a harmonization. However, it does suggest that the case for an upward harmonization rests with fairness rather than with economic efficiency.

3.6 Conclusion

In this paper, we have examined the effects of redistributive policy on the welfare of its citizens. We have relaxed several common assumptions of the migration literature, including fixed wages for employees, fixed marginal effects of redistribution on the welfare of the poor, and the absence of labor-leisure choice. We have shown that previous work which touted the efficiency-enhancing properties of centralization is crucially dependent on an absence of work-disincentive effects. When these effects are included, previous work systematically understates the magnitude of redistribution-induced spillovers. Moreover, optimal economic efficiency occurs when and only when all jurisdictions refrain from redistribution, and a transition from separate jurisdictional benefit policies to a single federal policy will not enhance economic efficiency unless the level at which benefits are harmonized is sufficiently low.

It should be noted that real-world governments do not (and should not) have economic efficiency as their only objective. For example, it is possible for political preferences to favor (de)centralization whether or not it promotes economic efficiency, as the Soviet Union and Slovakia have demonstrated. It is also possible that different levels of government might possess (dis)economies of scale with respect to the redistribution function, so that (de)centralization of the redistribution function might by itself affect the provision of redistributive benefits. Finally, there might be reason to believe that political actors will be less vulnerable to political pressure under a (de)centralized system of government, and this belief might affect whether redistributive decisions should be made by (for example) an unelected European Commission at the federal level or elected parliaments of federation

members. However, economic efficiency must play a role in the determination of public policy, and the results of this paper are unambiguous: previous work has overstated the efficiency-enhancing properties of uniform benefit policies.

The main conclusions of this paper bear directly on the question of benefit harmonization in the European Union. In particular, while members of the European Commission argue that benefit harmonization at a generous level would enhance economic efficiency, the analysis given in this paper demonstrates that such a conclusion is at best unwarranted and at worse erroneous. Indeed, efficiency gains can only be guaranteed when benefits are harmonized at the least generous level of the federation. Thus, while equity may demand a harmonization that extends generous benefits across every member of the European Union, it is quite possible that the fiscal externalities generated by such a harmonization would lower the economic efficiency of the EU.

Appendix

Proof of Result (7):

Implicitly differentiating (5a) with respect to b_i, we have

$$\frac{\partial E}{\partial b_i} = \frac{\partial \sum e_k}{\partial b_i}.$$

Since E is fixed and e_i is a function of the quantity $(Y^E - Y^P + b_i + g)$, it must be the case that

$$0 = \frac{\partial \sum e_k}{\partial b_i}$$

$$0 = \frac{\partial [e_i + \sum_{k \neq i} e_k]}{\partial b_i}$$

$$0 = e_i' \frac{\partial [Y^E - Y^P + b_i + g]}{\partial b_i} + \sum_{k \neq i} e_k' \frac{\partial [Y^E - Y^P + b_k + g]}{\partial} b_i$$

$$0 = e_i' + \frac{\partial [Y^E - Y^P]}{\partial b_i} \sum e_k'.$$

Rearranging terms, we obtain

$$\frac{\partial [Y^E - Y^P]}{\partial b_i} = -\frac{e_i'}{\sum} e_k' = \beta_i$$

which is the desired result. □

Proof of Result (9):

Given that $Y^P = b_i + g + a_i(p_i+\alpha e_i)$, it must be the case that $p_i+\alpha e_i = a_i^{-1}(Y^P-b_i-g)$. An implicit differentiation of (5) with respect to b_i reveals that

$$\frac{\partial(P+\alpha E)}{\partial b_i} = \frac{\partial \sum a_k^{-1}}{\partial b_i}.$$

Since P, E and α are fixed, it must be the case that

$$\begin{aligned} 0 &= \frac{\partial \sum a_k^{-1}}{\partial b_i} \\ &= \frac{\partial\left(a_i^{-1}+\sum_{k\neq i} a_k^{-1}\right)}{\partial b_i} \\ &= a_i^{-1}\left(\frac{\partial Y^P}{\partial b_i}-1\right)+\left(\frac{\partial Y^P}{\partial b_i}\right)\sum_{k\neq i} a_k^{-1} \\ &= \left(\frac{\partial Y^P}{\partial b_i}\right)\sum a_k^{-1'}-a_i^{-1'}. \end{aligned}$$

Rearranging terms yields

$$\frac{\partial Y^P}{\partial b_i} = \frac{a_i^{-1'}}{\sum a_k^{-1'}} = \pi_i$$

which proves the result. □

Proof of Result (11):

By definition, $E = \sum e_k(Y^E-Y^P+b_k+g)$. Differentiating this equation with respect to a change in the federal government subsidy, g, we obtain

$$\frac{\partial E}{\partial g} = \sum e_k^{-1}\left[\frac{\partial [Y^E - Y^P]}{\partial g} + 1\right].$$

Since E is fixed, its partial derivative with respect to g must be zero. Therefore,

$$\frac{\partial [Y^E - Y^P]}{\partial g} = -\frac{\sum e_k'}{\sum e_k'} = -1$$

which is the desired result. □

Proof of Result (12):

From equation (2), $p_i + \alpha e_i = a_i^{-1}(Y^P - b_i - g)$. Therefore,

$$\sum p_k + \alpha \sum e_k = \sum a_k^{-1}(Y^P - b_i - g)$$
$$P + \alpha E = \sum a_k^{-1}(Y^P - b_i - g).$$

Differentiating both sides with respect to g,

$$\frac{\partial [P + \alpha E]}{\partial g} = \sum (a_k^{-1})\left[\frac{\partial Y^P}{\partial g} - 1\right].$$

Since both P and E are constant,

$$0 = \sum (a_k^{-1})\left[\frac{\partial Y^P}{\partial g} - 1\right].$$

A rearrangement of terms yields

$$\frac{\partial Y^P}{\partial g} = \frac{\sum (a_k^{-1})'}{\sum (a_k^{-1})'} = 1$$

which is the desired result. □

Proof of Result (18):

Let W be the change in $(Y^E - Y^P)$ that occurs as a result of the influx of new poor. Since

$$\frac{\partial (Y^E - Y^P)}{\partial P} = -\frac{1}{\sum e_k'}$$

and the change in $(Y^E - Y^P)$ that results from interjurisdictional migration is β_I, it must be the case that

$$-W\sum e_k' = -P'(\beta_I - W)$$

in equilibrium. This equation may be simplified to

$$W\left(P' + \sum e_k'\right) = P'\beta_I$$

which may be further simplified to

$$W = \frac{\beta_I P'}{P' + \sum e_k'}.$$

The change in P is given by

$$\frac{\partial P}{\partial b_i} = -P'(\beta_i - \bar{W})$$

$$= -P'\left(\frac{\beta_i \sum e_k'}{P' + \sum e_k'}\right).$$

Therefore, we have

$$\frac{\partial P}{\partial b_i} = -\frac{e_i' P'}{P' + \sum e_k'}$$

which is the desired result. □

4 Do Interstate Welfare Differentials Affect Welfare Recipiency?

4.1 Introduction

The recent Republican takeover of Congress has brought renewed emphasis to the issue of welfare policy. Republican leaders argue that a decentralized welfare system will improve the economic efficiency of the United States and permit states to select policies that are favored by their own citizens rather than the nation as a whole. Opponents of the Republican agenda argue that a decentralized system will harm economic efficiency and encourage states to reduce the generosity of their welfare programs.

Previous chapters of this dissertation argue that benefit differentials across states will induce welfare migration and labor-leisure choice. There are two important implications to this conclusion. First, increased decentralization of welfare policy need not promote economic efficiency, although it is possible for U.S. economic efficiency to rise if states are sufficiently stingy under a decentralized system. Second, high-benefit states will be penalized (and low-benefit states rewarded) for their welfare benefit policies. These two implications suggest, to liberals and conservatives alike, that a truly decentralized welfare system will

create political and economic pressures whose end result will be a dramatic reduction in welfare benefits for the poor.

In order for this conclusion to have empirical relevance, it must be the case that a significant number of welfare recipients make migration and labor-leisure choices in response to interstate welfare benefit differentials. The primary purpose of this study is to examine the extent to which welfare differentials across states affect state welfare recipiency. Toward this end, I have compiled an extensive data set and calculated an improved measure of the benefit package available to welfare recipients. I also use an improved estimation technique and I suggest new interpretations for a number of variables. In addition, I consider several welfare-related administrative variables that have been ignored by past research into welfare recipiency.

The paper is organized as follows. In the second section, I give a brief review of the literature and I discuss the respects in which I improve upon the literature. In the third section, I present background information on the three major welfare programs for able-bodied adults in the United States. In the fourth section, I discuss the conceptual and data-collection difficulties that complicate benefit-package calculations. In the fifth section, I discuss the extent to which interstate welfare differentials exist across states and over time. In the sixth and seventh sections, I outline the two equations that compose the recipient/benefit-setting model of this paper. The eighth section discusses the estimation technique and details the precise equations to be estimated. The ninth and tenth sections present the statistical results and give concluding thoughts.

4.2 A Brief Review of the Literature

In recent years, empirical researchers have examined a number of issues that are related to welfare benefit packages. Ellwood and Bane [1986] and Moffitt [1990] examine marital-status effects and conclude that the provision of welfare benefits to unmarried mothers reduces the likelihood that those mothers will marry and that the magnitude of this effect has been rising over time, although the studies find no evidence that out-of-wedlock births are induced by welfare programs. Gottschalk [1990, 1992] examines the intergenerational transmission of welfare recipiency and concludes that parental welfare receipt increases the probability of welfare receipt among children. Moffitt [1981] examines the issue of welfare stigma and concludes that, while there is some evidence to suggest that stigma deters individuals from applying for welfare, society became much less intolerant of welfare recipiency during the 1960s and that this intolerance continued to fall in later years. Other studies have examined such topics as welfare exits [Piskulich 1993], cost-of-living differentials [Cebula 1979] and the share of state spending devoted to welfare programs [Tresch 1976].

A number of studies have examined welfare recipiency in the United States. While the findings of past work are mixed [Cebula 1979b, Danziger et al. 1981], more recent work is remarkably consistent in its contention that welfare benefits exert small but significant effects on migration, labor-leisure choice and welfare receipt [Moffitt 1992]. Cebula [1981] and Cebula and Koch [1989] examine one year of state data using ordinary least squares and

find that interstate migration is significantly related to the AFDC benefit level offered by a state. These results are verified by Cloutier and Loviscek [1989] for metropolitan areas and by Cebula [1991] for the state of Wisconsin. Blank [1985] examines labor-leisure choice and finds that welfare participation rates are influenced by the wages and benefits offered by a state. Micro-level analyses by Gramlich and Laren [1984] and Blank [1988] confirm the (small but significant) impact of AFDC levels on migration and labor-leisure choice. Finally, Peterson and Rom [1989] extend both the data (to three time periods) and the statistical methodology (to two-stage least squares) and find that state poverty rates are related to a measure of the AFDC/Food Stamps package.

Somewhat surprisingly, relatively few studies have directly examined benefit determination across states in the United States. Spall [1978] examines one year of state data using ordinary least squares and finds that state AFDC benefits are positively related to per capita income and negatively related to the proportion of state residents who receive benefits. Cebula [1981] also examines one year of state data using ordinary least squares and finds that AFDC benefits are positively related to the proportion of state residents who receive benefits and positively related to state unemployment. Orr [1976] and Gramlich [1982] examine a decade of state data and finds that AFDC benefits and the AFDC/Food Stamps package, respectively, are positively related to both per capita income and the federal matching rate. Finally, Peterson and Rom [1989] examine three years of state data using two-stage least squares and find that a measure of the AFDC/Food Stamps package is negatively related to the poverty rate of a state and positively related to the taxes levied by a state. While these studies reach somewhat different conclusions about the factors that influence benefit rate

determination, each finds some evidence that state welfare benefit packages are affected by politics.

I employ a data set that contains annual observations for the 1979-1991 interval. The thirteen years of this analysis far exceed those of previous work, which was generally limited to cross-sectional analysis and almost never exceeds three time periods. In general, data-collection difficulties are responsible for these limited data sets; much of the necessary data for a more extensive analysis are not readily available or are not published in a format that is conducive to computer analysis. Despite the difficulty of obtaining data, it is available for those who exert a sufficient amount of time and effort on data collection, and there are at least two reasons why it is useful to collect this data. First, the additional observations afforded by a larger panel data set should increase the efficiency of the coefficient estimates. Second, and most importantly, an extensive panel data set permits an analysis of both intertemporal and cross-sectional variation.

I also employ a more comprehensive measure of the welfare benefit package and I employ a more rigorous calculation method for the elements of that package. Two-thirds of the articles in this literature review, for example, use AFDC alone as a proxy for the welfare benefit package even though both Food Stamps and Medicaid provide substantial benefits to the poor. Most of the remaining articles use the AFDC-Food Stamps combination as a proxy for the package, but these articles do not consider the full set of Food Stamp regulations that affect the combination of the programs, which means that they use an incorrect estimate of the AFDC-Food Stamps package. Virtually none of the articles consider Medicaid, and those that do are hampered by an inability to distinguish between able-bodied users and the senior

citizen population, which introduces a severe upward bias into Medicaid use estimates. I consider each of these effects and calculate an improved welfare benefit package measure that incorporates AFDC, Food Stamps and Medicaid.

4.3 Welfare Programs in the United States

Before discussing the calculation of the welfare benefit package, it is useful to present some background information on the major welfare programs in the United States. There are three such programs available to able-bodied non-elderly individuals: Aid to Families with Dependent Children, Food Stamps and Medicaid. In this section, I discuss each of these programs.

4.3.1 Aid to Families with Dependent Children

Aid to Families with Dependent Children (AFDC) is the largest welfare program in the United States that gives cash payments to able-bodied individuals under 65 years of age. It was established by Title IV of the Social Security Act of 1935 "for the purpose of maintaining and strengthening family life by providing financial assistance and care to needy dependent children" [USDHSS OFA 1985]. While the initial legislation forbade payments to single mothers for their own use (rather than for the care of children), 1950 amendments to the SSA reversed this prohibition. By the early 1970s, the program had evolved into its

current form as an assistance program for all single-parent families who are sufficiently poor.

AFDC programs are formulated by states and approved for use by the federal government. In order to achieve federal approval, the Social Security Act sets certain guidelines which states are required to follow. First, everyone who is eligible for the program must have a reasonable opportunity to apply for the program. Second, administrative decisions regarding eligibility must be made within a reasonable period of time and no later than 45 days after receipt of application. Third, individuals whose requests for aid are denied must be given the opportunity for a fair hearing regarding the denial. Finally, individuals who have similar circumstances must receive equal treatment under the program.

Apart from the broad guidelines given under the Social Security Act, states have a remarkable amount of freedom in constructing their AFDC programs. Each state may set its own level of "need" for families with dependent children. While this level is supposed to reflect economic realities, states are not compelled to adjust their standards to correspond with living costs and few have done so. Furthermore, each state may set the amount of "need" that it will actually pay to program participants, and this payment need not reflect costs of living.

AFDC assistance payments are funded by states and by the federal government according to two different formulae under which, in general, states with lower levels of gross state product receive a higher matching rate from the federal government. The federal government matching rate is never less than fifty percent and has been as high as eighty percent. Administrative costs are also matched by the federal government, but at a constant

rate of fifty percent. States may require localities to pay a portion of the state share for either assistance or administration.

4.3.2 Food Stamps

The Food Stamp program is one of the largest in-kind welfare programs in the United States. It was established by the Food Stamp Act of 1964 in order to ensure that all individuals received adequate nutrition, and it is the only nationwide program for which low-income individuals are categorically eligible [USDA 1992]. Food Stamp payments were required to reflect nutritional needs in 1971, when the maximum benefit level was standardized across the continental United States at the purchase price of the Department of Agriculture's "Thrifty Food Plan." In subsequent years, this level has remained within three percentage points of the (inflation-adjusted) purchase price of the Thrifty Food Plan.

In its original formulation, states had substantial discretion over the Food Stamp program. Participating states could restrict the program to selected localities and offer a payment that did not reflect nutritional needs. Laws passed in 1971 and 1974, respectively, abolished these options and placed other restrictions on the program. Since 1975, states have had minimal flexibility: states may determine (but not set criteria for) Food Stamp eligibility and may choose to administer Food Stamps from offices used for other social welfare programs, such as Aid to Families with Dependent Children and Medicaid [U.S. House of Representatives 1994].

While every state has participated in the Food Stamp program since 1975, states retain

the right to opt out of the program. However, the entire cost of Food Stamp payments (and half the cost of administration) is borne by the federal government. Given this incentive structure, no state legislature has ever chosen to exit the Food Stamp program.

4.3.3 Medicaid

Medicaid is the fastest-growing welfare program in the United States. Established in 1965 under the authority of Title XIX of the Social Security Act, it was designed "to assist States in the provision of more adequate medical care to eligible needy persons" [USDHHS SSA 1993]. In many states, it has become the most costly single element of the welfare benefit package.

Medicaid programs are, like AFDC programs, designed by individual states and approved by the federal government. Certain criteria must be fulfilled for any Medicaid program; for example, states must grant Medicaid coverage to all AFDC recipients and must provide pediatric services for covered individuals. However, states have substantial discretion, both in the types of individuals and in the types of services that it chooses to cover. This discretion has led to considerable variation in Medicaid programs [USDHHS SSA 1993].

4.4 Calculation of the Welfare Benefit Package

In general, government statistics that are used to examine the welfare of the poor

assume that cash benefit programs (such as AFDC) are the sole component of the welfare benefit package. However, there are at least two other major social welfare programs in the United States: Food Stamps and Medicaid. Although the government has begun to include Food Stamps in some of its benefit calculations, it does not yet include them in such politically sensitive data as official poverty-rate statistics. Medicaid, too, has been largely excluded from consideration, although for a different reason: they are excluded because, according to the official yearly Ways and Means committee report on welfare programs in the United States, "the extent to which they increase disposable income is uncertain" [U.S. House of Representatives 1994].

In the social science literature, neither of these considerations have been mentioned as a reason to exclude Food Stamps and Medicaid from the welfare benefit package. Nevertheless, most previous empirical work in the economics and political science literatures has assumed that the AFDC program is the sole component of the benefit package [Orr 1976, Moffitt 1981, Ellwood and Bane 1986, Piskulich 1993].[1] In this section, I examine the conceptual and data-collection issues associated with the inclusion of Food Stamps and Medicaid, and I conclude that both programs should be included in calculations of the total welfare benefit package.

[1]Several political science studies actually exclude AFDC and examine Medicaid [Hanson 1984, Barrileaux and Miller 1988]. Since AFDC recipients comprise the bulk of the Medicaid eligibility pool, the exclusion of AFDC is even more problematic than the exclusion of Food Stamps or Medicaid.

4.4.1 Conceptual Issues

There are at least two theoretical issues that might call into question the inclusion of Food Stamps and Medicaid. First, AFDC recipients might be ineligible for the Food Stamp and Medicaid programs. Clearly, these programs cannot form a portion of the benefit package if they cannot be combined with AFDC. Alternatively, AFDC recipients might face a sufficient number of bureaucratic obstacles that they could not take advantage of one or both programs even with a legal right to apply. However, almost all AFDC recipients also receive Food Stamp benefits [USDA 1992], and every AFDC recipient is categorically eligible for Medicaid [Duvall 1983], which casts substantial doubt on this hypothesis. Also, federal law mandates that individuals who are eligible for these programs be able to receive them with minimal procedural obstacles. Furthermore, many states dispense all three programs from their AFDC local offices, which means that it is, in practice, no more difficult to apply for one program than it is to apply for all.

A second possibility is that AFDC recipients might not value the goods and services that are offered by the Food Stamp and Medicaid programs. Unlike the AFDC program, which gives cash grants to recipients, Food Stamp and Medicaid benefits are paid with goods and services. Economic analysis is unambiguous in its demonstration that in-kind grants are never worth more, and are generally worth less, to recipients than would be an unrestricted grant [Varian 1994]. Thus, if recipients would not wish to consume the full amount of food or medicine allotted by the programs and cannot exchange the remainder for cash, they will value these services at a lower rate than the benefit levels would indicate.

Econometric evidence suggests that Food Stamp coupons are virtually equivalent to cash grants [Hamermesh and Johannes 1985, Moffitt 1989], which strongly suggests that they should be included in any welfare benefit package at their face value. Medicaid benefits, however, are more difficult to analyze. A number of researchers have concluded that Medicaid services, while not in the form of vouchers and not exchangeable for cash, are best approximated as if they were given in the form of cash [Blank 1989, Winkler 1991]. Others have argued that Medicaid benefits should be valued at their perceived worth by the average welfare recipient, which has been estimated at approximately 23 cents on the dollar [Smeeding 1984, Murray 1994].[2] Still others have attempted to determine the health of individual recipients, under the assumption that less healthy individuals should place a higher value on Medicaid eligibility [Moffitt and Wolfe 1992]. Although any such calculation is problematic, I shall discount the monetary insurance value of Medicaid eligibility by the best available utility valuation estimate, twenty-three percent, and include the result in the benefit package.

4.4.2 Data-Collection Issues

There are serious data-collection problems associated with each component of the welfare benefit package. With respect to AFDC, empirical analyses generally employ average

[2]These analyses show that the utility derived by participants in government medical subsidy programs is an increasing function of income, with the average recipient valuing government-provided medical care at approximately 40 percent of its monetary value.

A few recent studies have noted the existence of this implicit tax and compensated for it in their analyses [Moffitt 1990b]. While this revised procedure is an improvement over previous work in the literature, it does not take account of an important feature of the Food Stamp implicit tax: the deductions available to Food Stamp recipients. Every family that receives Food Stamps is able to receive a "standard deduction," and an amount of income equal to this deduction is exempt from the implicit Food Stamp tax. When this deduction is ignored in the calculation of the total benefit package, the package overstates the effect of the implicit Food Stamp tax on Food Stamp benefit levels and understates the interstate variation in the value of the package.

In addition, an "excess shelter deduction" is available to all Food Stamp recipients who spend a sufficient amount of their income on housing expenditures. While the maximum amount of this deduction is fixed, recipients are only allowed to claim that portion of the deduction that actually reflects their excess shelter costs. In general, the allowable deduction is less than the maximum amount; the average recipient uses about half of the (inflation-adjusted) deduction, although a sizeable number of recipients use the full amount of the deduction. Interstate variation in the average excess shelter deduction is surprisingly small; the standard deviation across states in (for example) 1992 was about ten dollars, which would imply a three-dollar standard deviation in Food Stamp benefits across states [USDA 1992]. Furthermore, Food Stamp quality control data reveals that AFDC recipients are significantly more likely to use the maximum amount of the deduction than are other Food Stamp recipients. Thus, the best available approximation for this deduction is to assume that each recipient of the welfare package uses the entire excess shelter deduction [U.S House of

Representatives 1994]. Omission of this deduction would, like omission of the standard deduction, overstate the effect of the implicit tax and understate both interstate variation and the total value of the package. In this study, I include both the excess-housing deduction and the standard deduction.

Finally, there is an important data-collection difficulty with respect to Medicaid -- the separation of Medicaid outlays into AFDC and senior-citizen components. While most Medicaid expenditures in the early 1970s funded the medical needs of able-bodied individuals on Aid to Families with Dependent Children, elderly and disabled individuals began to form a higher proportion of covered individuals, and medical advances made coverage of these groups extremely costly relative to other individuals [Moffitt 1992]. Thus, the average value of Medicaid expenditures by state would significantly overstate the extent to which able-bodied nonelderly recipients of the welfare benefit package use Medicaid. However, the dollars expended on nonelderly individuals are only published on a national basis -- that is, they are not published (and are not readily available) at the state level for most years. For this reason, those few empirical researchers who note the existence and importance of Medicaid have nevertheless been compelled to exclude it from consideration, or else they have used state data that does not differentiate between types of Medicaid users [Gramlich 1982]. For this study, I have obtained unpublished data from the Health Care Financing Administration that details state-level Medicaid use by able-bodied non-aged welfare recipients, and I include Medicaid use by able-bodied individuals in this analysis.

In summary, the welfare benefit package consists of three programs: AFDC, Food Stamps and Medicaid. The AFDC portion of the package is proxied by the maximum, rather

than the average, AFDC benefit for a family of four. The Food Stamps portion is also proxied by the maximum benefit, but this benefit is adjusted by the implicit Food Stamp tax rate and by two deductions that are available to Food Stamp recipients. The Medicaid portion is the expected amount of Medicaid usage for an able-bodied adult and three children, which serves to exclude the senior-citizen and disabled populations, multiplied by twenty-three percent in order to account for its value to welfare recipients. The sum of these three components is the total welfare benefit package that I employ in this paper.

4.5 An Examination of Benefit-Package Data

Table 4.1 contains summary statistics of the benefit-package data from the first and last year of this study, calculated in accordance with the previous sections and adjusted for both inflation and price differentials, for a family of four. This table illustrates the extent to which welfare benefit packages differ across the states. In general, the most generous state in each year between 1979 and 1991 offers a package that is about twice as generous as that of the least generous state. Interestingly, both the nation's smallest state (Vermont) and the nation's largest state (New York in 1979 and California in 1991) were among the most generous states; covariance analysis reveals that there is virtually no correlation between the size of a state's population and the size of its welfare benefit package. In real terms, the average welfare benefit package declined slightly between 1979 and 1991 (from $646 to

$630), but a substantial number of states offered higher benefits in 1991 than they had in 1979.

An examination of the states in the most and least generous categories of Table 4.1 suggests that the benefit packages offered by states are similar across regions of the United States. Nine of fifteen states in the South and South Atlantic regions belong to the set of states whose benefit packages are least generous; none are members of the 10 most generous states. On the other hand, states in New England and the Great Lakes regions are disproportionately represented in the set of states whose benefit packages are most generous, and none are among the 10 least generous states. This observation is consistent with the contention of Orr [1976] and Moffitt [1990b] that regional effects play an important role in welfare-related issues, although it is also consistent with the hypothesis that variables ignored by these authors but correlated across regions are the true determinants of benefit levels in the United States.

Table 4.2 compares the AFDC-Food Stamp component of state benefit packages with the Medicaid component in 1991 for the twenty states in Table 4.1, calculated in accordance with the previous section and adjusted for cost-of-living differentials. This table illustrates the variability of these components and the lack of correlation between them. Indeed, the correlation between the two components across the entire sample is quite low (.1), which suggests that statistical results using the total welfare package may differ from those of previous work. The average AFDC-Food Stamp component was $552, with a variance of $79, and the average Medicaid component was $338 with a variance of $93.

While these comparisons provide insight into the data, one of the most important

advantages of panel data is the ability to examine intertemporal variation. In order to illustrate the extent of intertemporal variation in the data set, I present detailed benefit-package data for two midwestern states, Michigan and Wisconsin, in Table 4.3. The states are similar in many respects, and both reduced the size of their benefit packages by approximately $100 for each recipient over the 1979-1991 interval, from $800 to $700. However, the benefit level in Michigan dropped sharply during the first few years of this interval and remained constant thereafter, whereas the benefit level in Wisconsin remained relatively constant until the last few years of the interval. A purely cross-sectional analysis would observe either an identical benefit (if it examined a year at an endpoint of the interval) or a substantially different benefit (if it examined a year in the middle of the interval), but use of a panel data set can permit an examination of (and perhaps an explanation for) both occurrences.

A final table, Table 4.4, illustrates the importance of both intertemporal variation and a comprehensive measure of the welfare benefit package through an examination of two midwestern states, Ohio and Indiana. The two states are similar in many respects, and the benefit package of both remained relatively constant over the 1979-1991 interval at approximately $600. However, the AFDC/Food Stamps component of Indiana's benefit package fell three times as much as that of Ohio, whereas the Medicaid component of Ohio's benefit package rose by considerably less than that of Indiana. For this reason, a dataset that excluded Medicaid would understate the benefit package offered by Indiana and overstate that of Ohio, whereas a dataset that excluded AFDC/Food Stamps would understate the benefit package offered by Ohio and overstate that of Indiana.

Given this examination of the data, I move to the two relationships I seek to explain. The next two sections present discussions of welfare recipiency and benefit determination.

4.6 Determinants of Welfare Recipiency

I postulate a recipient model in which welfare recipiency is a function of three factors: the welfare generosity of the state, the labor market conditions in the state and the locational amenities of the state. In other words,

$$Recipiency = f(Generosity, Labor\ Market, Amenities). \quad (1)$$

In this section, I discuss the recipient equation.

4.6.1 Welfare Recipiency

The dependent variable of the recipient equation is welfare recipiency. For this variable, I primarily use the proportion of state families on the welfare rolls, which I shall call the *recipiency proportion*, although I also examine the number of welfare families in a state.[3] While it may seem self-evident that an analysis of welfare recipiency should have as its

[3]Use of the recipiency proportion provides a normalization with respect to state population.

dependent variable some measure of the recipient population, the seminal papers on a related subject (welfare-induced migration) uses poverty-rate data as its dependent variable [Peterson and Rom 1989, 1990]. The authors give a three-step argument in support of their decision to use poverty-rate data. First, they assert that the size of the recipient population should not be used in analyses of welfare-induced migration because it is a function of both welfare-induced migration and labor-leisure choice. Next, they note that poverty rates are more closely related to the AFDC population than other measures that have been used as a dependent variable in the literature. Finally, they state that many poor people spend short amounts of time on AFDC and then leave the program, which suggests that poverty rates may be far more closely related to AFDC beneficiaries than is suggested by static data.

However, there are serious problems with the Peterson and Rom methodology. First, there is no obvious reason to exclude labor-leisure choice from the model; politicians are surely concerned with both effects, so empirical estimations of benefit choice that ignore labor-leisure choice reduces the relevance of these studies to debates over public policy. Second, the use of a poverty-rate dependent variable does not actually exclude labor-leisure choice from the data, as Peterson and Rom themselves suggest in a subsequent paragraph. In particular, although they are not convinced that changes in welfare benefits affect labor-leisure choice, they note that "[t]o the extent these relationships exist, poverty rates within a state could change as a function of changes in welfare policy without any migration" -- which is precisely the argument that was used to abandon the size of the recipient population in favor of poverty rates. Given the failure of this variable to expunge labor-leisure effects and the political relevance of the labor-leisure decision, the argument that over one-third of

the poor receive AFDC makes it even more imperative to use the actual variable of interest (AFDC recipiency) rather than an imperfect correlate (poverty).

4.6.2 Welfare Generosity

Perhaps the most important measure of a state's welfare generosity is the welfare benefit package offered by the state. In addition, however, there are several AFDC administrative parameters that have been ignored by previous work but that might influence welfare recipiency. First, approximately one-fourth of the states in the United States offer presumptive eligibility to individuals who apply for AFDC. Under AFDC regulations, states are empowered to give welfare benefits to individuals whose applications are under review, provided a cursory examination suggests that the individuals will ultimately receive approval. In effect, presumptive eligibility provides a lump-sum payment to applicants that should (other things equal) encourage individuals to enter the welfare rolls.

Second, the number of local welfare offices exhibits enormous variation across states. At these local welfare offices, nonrecipients can enter the welfare rolls and recipients can resolve procedural difficulties. Thus, an increase in the prevalance of welfare offices should affect both the cost of joining the welfare rolls and the opportunity cost of leaving the welfare rolls. For both of these reasons, the prevalence of local welfare offices should exert a positive impact on welfare recipiency.

Finally, states are allowed to offer additional allowances to AFDC recipients who become pregnant. In a paper that has been highly influential in both academic and political

circles, Ellwood and Bane [1986] argue that welfare recipients are not encouraged to have additional children by any additional welfare payment they would receive for such children. While there is no empirical evidence to suggest that Ellwood and Bane are in error, their result is peculiar because it appears to contradict fundamental tenets of consumer theory. In particular, it has been shown that a decrease in the price of a normal good induces individuals to consume more of that good [Varian 1994], yet the Ellwood-Bane result suggests that individuals do not respond to economic incentives where pregnancy is concerned. An important and generally ignored (including by Ellwood and Bane) aspect of state welfare policies is that an additional allowance for pregnancy can be received in some states as early as the sixth month of pregnancy. A positive relationship between welfare recipiency and pregnancy subsidies, while not a direct test of the Ellwood-Bane result, would suggest that (at least in some contexts) pregnancy is (like most other goods) affected by economic incentives.

4.6.3 Labor-Market Conditions

To this point, we have considered the welfare generosity of a state and we have concluded that states with more generous welfare packages should experience higher levels of welfare recipiency. There is, however, another factor that may influence welfare recipiency -- the opportunity cost of abandoning the labor market. Just as relatively generous welfare benefit packages should induce individuals to leave the labor market for the welfare rolls, relatively favorable labor-market conditions should induce individuals to leave the welfare

rolls for the labor market.

There are at least two important job-related considerations: the unemployment rate of a state and the average wage offered by that state. When unemployment is low and wages are high, labor-market prospects are favorable and individuals will face a higher opportunity cost if they exit the labor market; when unemployment is high and wages are low, labor-market prospects are unfavorable and individuals will face a lower opportunity cost if they exit the labor market. For this reason, unemployment should be positively related to welfare recipiency and wages should be negatively related to welfare recipiency. A third consideration, unmarried birth rates, is important for a different reason -- such births facilitate entrance onto the welfare rolls and thereby raise the opportunity cost associated with work.

4.6.4 Amenities

There is a sizeable economics literature on locational amenities. In general, these works attempt to derive hedonic prices for amenities in order to compare the "quality of life" across states or metropolitan areas. Rosen [1979], the pioneering work in this literature, found that locational amenities affect the prevailing wage offered by a jurisdiction. He identified four types of locational amenities that are relevant to individual decisionmaking: climate, crime, crowding, and pollution. Subsequent work examined wages and housing rents [Roback 1982, 1988, Blomquist et al. 1988] and migration [Graves 1979, Porell 1982, Greenwood et al. 1991] with respect to amenities and found that amenities affect all of these variables in the manner predicted by economic theory. To the extent that migration is

possible among welfare recipients, the number of welfare recipients in a state should be positively related to the amenities offered by that state, and the recipiency proportion should be affected by any amenity to which recipients and nonrecipients exhibit a differential response.

Perhaps the seminal study of welfare migration in the political science literature [Peterson and Rom 1989] asserts that the inclusion of locational amenities is necessary to control for their effects on welfare recipiency and asserts that the change in population of a state is a useful proxy for those amenities. While their inclusion as control variables is useful, it is unclear that population changes (while affected by amenities) actually proxy for their effects, and such a supposition is in any event unnecessary. It is both possible and desirable to use actual data on locational amenities rather than assuming that population will proxy for it.

4.7 Determinants of the Benefit Package

I postulate a benefit model in which the size of the welfare benefit package in a state is a function of four factors: the matching-rate incentives faced by a state, the political opinions of state citizens and the partisan affiliation of state officials, the strength of pro-redistribution constituencies and state economic conditions. In other words,

Benefit package = f(Matching-Rate Effects, Politics, Constituencies, Economics). (2)

In this section, I discuss the benefit equation.

4.7.1 Matching-Rate Incentives

Perhaps the most important variable with respect to funding for the AFDC program is the Federal Medical Assistance Percentage. This percentage, which differs by state and is roughly proportional to per capita disposable income, is the federal matching rate for the AFDC program. These rates generally range from 50% for the wealthiest states to 65% for the poorest states. Previous work has noted the existence of matching-rate differentials and suggested that these differentials affect the size of the welfare benefit package in a state [Moffitt 1984, 1990b; Orr 1976], although a surprising number of studies have ignored matching rates as a determinant of state benefit levels [Peterson and Rom 1989].

A theoretical difficulty with the use of matching rates is that states may choose to employ an alternative matching formula that matches most of the first $32 of AFDC benefits but none thereafter. Since even the least generous state offered AFDC benefits at least twice as large as the matched amount by 1979, use of this alternative matching formula would always lower the amount of money received from the federal government. Despite (or perhaps because of) this property, several states remained on the older formula until 1983. Moffitt [1984] regards this tendency as "curious" and excludes these states from subsequent work, both for their seeming irrationality and for this formula's lack of compatibility with the F.M.A.P. formula. However, a political decision to remain on the old formula need not be irrational -- state policymakers who view AFDC as a "public bad" rather than a public good

might believe that the political incentives of a switchover will inevitably produce higher AFDC benefits, and the lesser federal support offered by the old formula might be an acceptable price to pay in order to lessen the probability. Also, there is no fundamental incompatibility with the newer formula: the older formula pays a fixed amount of approximately twenty-five dollars and matches at a marginal rate of zero, while the newer formula pays a fixed amount of zero dollars but matches at a marginal rate of at least fifty percent. Thus, a reparameterization of the matching formula into its two components (a fixed payment and a matching rate) permits the inclusion of every state. Finally, it can be argued that the matching rate faced by a state should be measured by the most generous rate to which they are legally entitled. Under this assumption, which I shall employ in this paper, every state should be modeled as if it were on the newer formula.[4]

An empirical problem with the matching-rate formula is that it is, by definition, a function of personal income. Traditional work predicts that the welfare benefit package offered by a state will be positively related to per capita income because altruism will induce relatively wealthy citizens to favor higher benefits for the poor [Orr 1976]. However, the matching-rate formula guarantees that states with higher per capita income will receive a less generous matching rate from the federal government.[5] Thus, a positive coefficient for the matching-rate variable is entirely plausible in this framework and it is not possible to

[4]Technically, a state cannot switch to the newer formula unless it chooses to offer Medicaid.

[5]The matching-rate formula also introduces the problem of endogeneity, because public policy decisions that would improve state personal income must reduce the federal matching rate for the state.

distinguish altruism effects from the extent to which matching-rate considerations influence state benefit-setting.

Fortunately, it is possible to examine matching-rate effects through another variable: the extent to which the non-federal share of AFDC is paid by local (rather than state) governments. States are empowered to shift the cost burden of AFDC onto counties or other localities, and a considerable number of states have done so in any given year. To the extent that state officials view such cost-shifting as a costless grant from localities to states, cost-shifting should encourage states to offer higher welfare benefit packages. Thus, cost-shifting provides a measure of the extent to which state legislatures respond to matching-rate considerations.

There is one consideration that might affect this prediction: the existence of local boards with some decisionmaking authority over welfare administration in their local areas. States are permitted but not required to delegate a portion of their authority to these boards, and approximately one-half of states have chosen to do so in any given year. In general, there is no reason to believe that local boards would systematically encourage or discourage welfare expenditures by states, and a cursory examination by Tresch [1976] finds no evidence that local boards affect state welfare policy. However, this result may be due to model misspecification. In particular, locally elected welfare board members have a powerful incentive to curtail social spending in states where localities must pay for a portion of the spending because local officials would be directly responsible for the increased taxation caused by high welfare expenditures. Thus, it appears that local boards should be included as an interactive variable (with cost-shifting) in order to capture a local-board effect.

4.7.2 Politics and Political Opinion

Past work in political science suggests that states in which politics is intertwined with morality will be more likely to provide generous AFDC benefits because the absence of such generosity would be immoral [Peterson and Rom 1989]. As previously noted, however, benevolence need not imply generous welfare benefits for the poor when such benefits will induce individuals to choose leisure over labor; even when labor-leisure effects are absent, benevolence might imply generosity with respect to private donations rather than compulsory taxation. Therefore, the tax burden borne by states probably measures the policy liberalism of a state rather than the moralism of its political culture. Viewed in this light, the finding of Peterson and Rom that high-tax states offer higher welfare benefits is easily understood.

Despite Peterson and Rom's misinterpretation, the policy liberalism of a state's electorate is relevant to benefit determination. Several measures have been used in the literature to proxy for policy liberalism, including state tax progressivity [Spall 1978] and warm-weather climate [Cebula 1981]. However, there are a number of measures that would provide a more direct measure of policy liberalism on the part of the electorate, and previous work has found that these measures exert a significant influence on state public policy [Erikson, Wright and McIver 1989].

Another state political factor is the partisan affiliation of state officials. Since the size of a state's welfare benefit package is selected by state politicians, politicians with liberal views should choose to offer a relatively high welfare benefit package. Perhaps the most common measure of the liberalism of state officials is their partisan affiliation, and it is

hypothesized that states whose legislative or executive branches are controlled by Democrats will produce relatively liberal public policy outcomes. This conclusion, however, is crucially dependent on two assumptions. First, the two major political parties must have held opposite positions on welfare policy during the years under consideration, but it is far from clear that (at least until recent years) Democrats supported social spending and Republicans opposed it. Second, the partisan affiliation of state officeholders must contain information over and above state public opinion. Fortunately, data on the political affiliation of state legislators and state governors is readily available, so it is possible to test the hypothesis that Democratic legislatures and executives should provide higher welfare benefit packages to the poor.

In addition to these variables, previous work in political science has suggested that state welfare policy is affected by the extent to states have strong two-party systems and class-based cleavages [Jennings 1979, Fry and Winters 1970]. This literature postulates that states with these characteracteristics will be characterized by greater "political influence" (of the poor) and that this influence will (independent of the partisan affiliation of state officials or the policy liberalism of the electorate) lead to a higher welfare benefit package. While political influence has been ignored by the economics literature, Peterson and Rom [1989, 1990] construct a measure for it in their seminal work on welfare recipiency and find it to be highly significant. In order to examine the importance of political influence and to maintain comparability with past work, I calculate a measure of political influence and include it in the model.

4.7.3 Constituencies

There is good reason to believe that welfare recipiency, which is the dependent variable in the recipiency equation, is endogenous to the benefit-determination decision. Interest-group models predict that the voting impact of a given constituency is determined by the proportion of the electorate who belong to the constituency [Plotnick 1986]. In other words, the political power of a given interest is (at least in a democratic society) positively related to its support among the electorate. According to these models, the recipiency proportion should be positively related to the size of the welfare benefit package.

Previous empirical work suggests that welfare generosity does not encourage unmarried births [Ellwood and Bane 1985]. However, such a conclusion does not negate the possibility that unmarried births affect state benefit levels. Since unmarried births facilitate entrance onto the welfare rolls, a larger proportion of unmarried births suggests larger voter support for redistributive programs. Therefore, other things equal, a larger proportion of unmarried births should imply a higher level of welfare benefits.

4.7.4 Economics

There are two separate economic factors that may be relevant to benefit determination: unemployment and wages. With respect to wages, traditional work in the altruism literature predicts that higher-wage jurisdictions will offer higher levels of welfare benefits because the provision of such levels is less costly (in utility terms) for individuals in

higher-wage jurisdictions [Orr 1976]. With respect to unemployment, however, it is difficult to make a prediction. On the one hand, politicians who sympathize with poor economic conditions might choose to increase the size of the welfare benefit package when unemployment is high; on the other hand, politicians who fear a large influx of recipients might choose to decrease the size of the welfare benefit package when unemployment is high.

4.8 The Model

4.8.1 Estimation Technique

There are two equations to be estimated: the recipient equation and the benefit equation. Since the dependent variable of each equation is an endogenous variable of the other, there is a simultaneous-equations problem. In particular, since welfare recipiency is a function of the welfare benefit package and the welfare benefit package is a function of welfare recipiency, a single-equation estimator such as ordinary least squares will not produce efficient coefficient estimates [Greene 1990]. In fact, the estimates will be inconsistent, which strongly suggests that a simultaneous-equations estimator should be employed.

Also, the data is of a panel nature, which presents cross-sectional and time-series difficulties. When the dependent variable of an observation is partially determined by its time-series (year) or cross-sectional (state) identity, a failure to account for these attributes will bias the coefficient estimates of any independent variable that is correlated with years or states

[Hsiao 1986]. Under the assumption that these effects (whether caused by the years/states themselves or by omitted-variable bias) involve a time-series component independent of state and a cross-sectional component independent of time, the introduction of dummy variables (fixed-effects) for states and years is sufficient to produce unbiased and consistent coefficient estimates.

Finally, there is a boundary problem associated with the recipiency proportion. In order for the underlying assumptions of hypothesis testing to hold, it is necessary that the distribution from which the dependent variable is drawn be unbounded [Greene 1990]. However, the recipiency proportion is (by definition) limited to the [0,1] interval, which implies that standard hypothesis-test statistics for a recipiency-proportion model would not test the hypotheses they are intended to examine. A log-odds transformation of the recipiency proportion, ln ((RP/(1-RP)) where RP is the recipiency proportion, is sufficient to eliminate the boundary problem.

The estimation technique employed in this study is fixed-effects two-stage least squares. This technique is a simultaneous-equations estimator that compensates for both time-series and cross-sectional correlations. Since regional effects have been important in past work that did not have enough data to employ state fixed-effects, I estimate both state and regional fixed-effects models for purposes of comparison. As previously noted, the recipiency equation is estimated for two related dependent variables, the (log-odds of the) recipiency proportion and the number of welfare families, although I shall focus on the recipiency-proportion results.

4.8.2 Equations and Hypotheses

The recipiency model is of the form

$$Recipiency_{it} = a + b_1 Package_{it} + b_2 PregSub_{it} + b_3 Offices_{it} + b_4 PresElig_{it} + b_5 Unemp_{it} + b_6 Income_{it} + b_7 Crime_{it} + b_8 UnBirths_{it} + b_9 Sun_{it} + b_{10} Hosp_{it} + b_{11} Superfund_{it} + b_{12} Urban_{it} + \sum d_{1t} Year_t + \sum d_{2i} State_i + e_i + k_t + u_{it}$$

where each b_{jk} and d_{jk} is a regression coefficient, a is a constant term, $Year_t$ represents time-series dummies, $State_i$ represents cross-sectional dummies, e_i represents a cross-sectional fixed-effect, k_t represents a time-series fixed-effect and u_{it} represents a normally distributed error term. The variables are coded as follows:

$Recipiency_{it}$ is the (log-odds of the) proportion of families on the welfare rolls.
$Package_{it}$ is the welfare benefit package level as measured by this paper.
$PregSub_{it}$ is a dummy variable that denotes the presence of a pregnancy subsidy.
$Offices_{it}$ is the number of welfare offices per capita.
$PresElig_{it}$ is a dummy variable that denotes the presence of presumptive eligibility.
$Unemp_{it}$ is the proportion of job-seekers in a state.
$Income_{it}$ is the average wage.
$UnBirths_{it}$ is the proportion of all births that occur to unmarried mothers.
$Crime_{it}$ is the Federal Bureau of Investigation's crime index.
Sun_{it} is the percentage of time that a state receives sunlight.
$Superfund_{it}$ is the number of Superfund sites per square mile.

$Hosp_{it}$ is the number of hospitals per capita.

$Urban_{it}$ is the percentage of citizens who live in urban areas.

These variables may be divided into three categories: welfare generosity, labor-market conditions and locational amenities. For welfare generosity, there are four measures: the size of the welfare benefit package, the presence of a pregnancy subsidy, the number of welfare offices per capita and the presence of presumptive eligibility. Each of these variables increases the welfare generosity of a state, and each should be associated with a higher level of welfare recipiency. For labor market opportunities, there are three variables: the proportion of job-seekers in a state, the per capita income of a state and the proportion of unmarried births in a state. Job-seeking and unmarried births should be associated with a higher level of welfare recipiency, while per capita income should be associated with a negative level of welfare recipiency. Finally, there are five measures of locational amenities: the crime rate, the amount of sunlight, the number of hospitals per capita, the prevalance of Superfund sites and the urban percentage. The coefficients of these variables cannot be predicted a priori in the recipient-proportion framework because they measure the relative attraction of the amenities to welfare recipients as compared to the general population. In the family-based equation, however, crime, Superfund sites and urban percentage should be negatively related to the number of welfare recipients; sunlight and hospitals should be positively related to the number of welfare recipients.

The benefit model is of the form

$$Package_{it} = c + b_{21}MatchRate_{it} + b_{22}CostShift_{it} + b_{23}Board_{it} + b_{24}Board_{it}CostShift_{it} + b_{25}DemLeg_{it} + b_{26}DemGov_{it} + b_{27}DemLeg_{it}DemGov_{it} + b_{28}DemPres_{it} + b_{29}PolInf_{it} + b_{30}UnBirths_{it} + b_{31}UnDif_{it} + b_{32}Unemp_{it} + b_{33}Recipiency_{it} + b_{34}Wage_{it} + \sum d_{1t}Year_t + \sum d_{2t}State_i + e_i + k_t + u_{it}$$

where each b_{jk} and d_{jk} is a regression coefficient, a is a constant term, w is an index variable to distinguish between the recipiency-proportion and family-based models, $Year_t$ represents time-series dummies, $State_i$ represents cross-sectional dummies, e_i represents a cross-sectional fixed-effect, k_t represents a time-series fixed-effect and u_{it} represents a normally distributed error term. The variables are coded as follows:

$Benefit_{it}$ is the welfare benefit package as calculated by the methodology of this paper.

$MatchRate_{it}$ is the percentage of the welfare package that states must pay.

$CostShift_{it}$ is a dummy variable that denotes the presence of local cost-shifting.

$Board_{it}$ is a dummy variable that denotes the presence of locally elected welfare boards.

$Board_{it}CostShift_{it}$ denotes the interaction between cost-shifting and local boards.

$DemLeg_{it}$ is a dummy variable that denotes a state legislature in which both chambers are controlled by Democrats.

$DemGov_{it}$ is a dummy variable that denotes a Democratic governor.

$DemLeg_{it}DemGov_{it}$ is a dummy variable that denotes a Democratic legislature and a Democratic governor.

$DemPres_{it}$ is the popular vote received by the most recent Democratic presidential candidate.

$PolInf_{it}$ is the Peterson-Rom measure of political influence.

$UnBirths_{it}$ is the proportion of all births that are to unmarried mothers.

$UnDif_{it}$ is the difference of the proportion of white births to white unmarried mothers and the proportion of nonwhite births to nonwhite unmarried mothers.

$Unemp_{it}$ is the proportion of job-seekers.

$Recipiency_{it}$ is the (log-odds of) the proportion of families on the welfare rolls.

$Income_{it}$ is the average wage.

These variables may be divided into four categories: matching-rate incentives, politics, constituencies and economics. For matching-rate incentives, there are four measures: the federal matching rate, the presence of local cost-shifting, the presence of locally elected welfare boards and an interactive term involving local cost-shifting and locally elected welfare boards. The presence of local cost-shifting should be positively related to the size of the welfare benefit package, while the federal matching rate and the board/cost-shifting term should be negatively related to the size of the welfare benefit package. For politics, there are a number of variables: the percentage of state citizens who supported the most recent Democratic presidential candidate, the presence of local boards, the presence of a Democratic legislature, the presence of a Democratic governor, and an interaction between a Democratic legislature and a Democratic governor. Each of these variables should be associated with a higher welfare benefit package. For constituencies, there are two measures: the recipiency proportion and the proportion of births to unmarried mothers. Each of these variables should be associated with a higher welfare benefit package. Finally, there are two economic variables: the proportion of individuals seeking employment and the average wage available to workers. There are no predicted signs for these variables.

The means and variances of each variable are presented in Table 4.5. This table illustrates that both the independent and dependent variables exhibit substantial variation.

4.8.3 Data Sources for Welfare Variables

The data covers the continental United States, including the District of Columbia, from 1979 to 1991.[6] AFDC, Food Stamp and Medicaid data were obtained from various years of *Characteristics of State Plans for Aid to Families with Dependent Children*, *Characteristics of Food Stamp Recipients*, the *Green Book*, the *Statistical Abstract of the United States*, and the *Annual Statistical Supplement of the Social Security Bulletin.* Unpublished Food Stamps and Medicaid data were obtained from the Departments of Agriculture and Health and Human Services.

4.9 Empirical Results

4.9.1 Recipiency Results

The statistical results, which are presented in the last column of Table 4.6, provide mixed evidence on the importance of welfare generosity. The coefficient for the welfare

[6]Three states are excluded from the analysis: Alaska, Hawaii and Nebraska. The exclusion of Alaska and Hawaii is due to migration-cost issues; Nebraska is omitted because of its unicameral nonpartisan state legislature.

benefit package is positive but insignificant at the 5% level, which means that the effect of the welfare benefit pacakage is not statistically different from zero.[7] On the other hand, both the presence of a pregnancy subsidy and the prevalence of welfare offices exert a statistically significant effect on welfare recipiency. These findings suggest that additional welfare offices reduce the cost of applying for the welfare benefit package and that individuals consider economic incentives with respect to pregnancy. Interestingly, the regional-effects model (which previous work was compelled to use due to a smaller number of observations) gives a statistically significant positive effect for the welfare benefit package; these results, which are also presented in Table 4.6, suggest that the omission of state fixed-effects has caused previous work to overstate the effects of the welfare benefit package on individual incentives.

Labor-market conditions also exert a statistically significant effect on welfare recipiency. The proportion of job-seekers in a state is positive and significant, which suggests that a difficult labor market encourages individuals to enter the welfare rolls. In addition, the coefficient associated with per capita income is negative and significant, which suggests that the opportunity cost associated with welfare is higher in states with higher-paying jobs. Both of these results are consistent with the hypothesis that welfare recipiency is affected by economic forces. In addition, unmarried births exert a positive and significant effect, which is consistent with the hypothesis that unmarried births facilitate entrance onto the welfare rolls.

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[7]The insignificance of the package (which is an instrument) is consistent with the hypothesis that a simultaneous-equations framework was unnecessary. However, this hypothesis may be tested with a Hausman test [Green 1990]; the appropriate statistic has a value of 200.1 with a critical value of 88.3 at the .05 level, so the hypothesis is rejected in favor of the simultaneous-equations framework.

In general, amenities do not appear to exert a differential effect on recipients and nonrecipients. There is, however, an exception: welfare recipients appear to be relatively averse to Superfund sites. One reason for this might be that the relative poverty of welfare recipients compels them to live near such sites. A second possibility, which has been suggested by previous work, is that polluters choose to pollute in low-income areas in order to minimize the risk of legal challenge [Coursey 1994]. This result is interesting, and it bears further investigation.

Table 4.7 interprets the recipient-equation results for a state with average welfare recipiency. For a state with average welfare recipiency, the presence of a pregnancy subsidy increases the size of the welfare rolls by 5.54% and a doubling of the number of welfare offices increases the size of the welfare rolls by 12.68%, which underlines the importance of welfare-related factors to individual decisionmaking. A one-percent (absolute) increase in the rate of unemployment increases the size of the welfare rolls by 1.92%, while a $1000 increase in the average (yearly) wage causes a 9.92% reduction in the size of the welfare rolls; both of these factors highlight the importance of labor-market conditions to welfare recipiency. Finally, a one-percent (absolute) increase in the proportion of babies born to unmarried mothers increases the size of the welfare rolls by 2.00% and a doubling of state Superfund sites increases the size of the welfare rolls by 0.71%.

While the ratio-based equation provides a better measure of welfare recipiency than the family-based equation, an examination of the family-based equation is instructive because of its implications for locational amenities. The family-based fixed-effects equation, which is presented in the third column of Table 4.6, confirms the hypothesis that welfare families,

like other individuals, migrate in order to receive better amenity packages. States with lower crime rates, more sunlight, more rural areas and higher per capita incomes tend to attract larger numbers of welfare recipients. On the other hand, states with large numbers of Superfund sites also seem to attract welfare recipients, contrary to expectations, and hospitals appear to exert an indeterminate effect on the size of the welfare rolls. In general, then, the family state-effects equation confirms the hypothesis that welfare families, like other individuals, migrate in response to interstate amenity differentials.

4.9.2 Benefit Results

The statistical results, which are presented in the last column of Table 4.8, provide only weak support for the importance of political and economic considerations in the benefit-setting process. None of the matching-rate variables attain statistical significance. However, two political variables attain significance in the predicted direction, Democratic control of state government and political influence. On the other hand, the policy liberalism of a state appears to exert a negative and significant effect on the size of the welfare benefit package, which suggests that further work is needed on this issue.

With respect to constituency variables, it does not appear that welfare recipiency exerts a significant effect on the welfare benefit package. However, births to unmarried mothers exert a positive and significant effect on welfare benefit packages. If an additional one percent of total births were to occur to unmarried mothers, state benefit levels would rise by about three dollars, which suggests that a larger proportion of unmarried births does

translate into a larger pool of voters who support welfare expenditures. The difference between unmarried birth rates for minorities and whites does not exert a significant effect on the size of the package, which is consistent with the hypothesis that racial motivations do not affect welfare politics.

These results are generally echoed by the family-based state-effects framework. Interestingly, however, the regional fixed-effects models find that virtually all variables attain statistical significance in the predicted directions. In these models, which are also presented in Table 4.7, both local cost-shifting and local boards exert significant positive effects on state benefit levels, while the interaction of these effects induces a significant negative effect on the levels. Democratic control of state government, political influence and Democratic presidential support are all positive and significant. These findings, like similar findings in the recipient equation, suggest that the inability of previous work (because of data limitations) to include state fixed-effects has biased their results toward the hypothesis that political and economic considerations influence the decisions of state officials.

4.10 The Importance of State Fixed-Effects

When unobservable factors constant across states affect a dependent variable, econometric models that do not account for these factors will produce biased coefficient estimates. In all probability, each state has unique attributes that are difficult to quantify but are nevertheless present. Two examples relevant to the issue of welfare recipiency are Utah,

in which the Mormon church performs a number of government-like activities, and the mountain states, in which both liberal and conservative residents have an unusual belief in self-sufficiency. By including state fixed-effects, econometric results are (under certain conditions) unbiased despite the existence of these effects.

Table 4.9 provides a graphical illustration of the state fixed-effects coefficients of the previous section. In the graph, the horizontal axis refers to the recipiency equation and the vertical axis refers to the benefit equation. The graph reveals a substantial amount of interstate variation in the fixed-effect coefficients; for example, the benefit equation coefficients have a range of $328. It also suggests that the two types of fixed effects are largely independent of each other; regression of each on the other yields a positive but statistically insignificant result.

In general, past work has employed regional fixed-effects rather than state fixed-effects because of the relatively small size of their data sets. For example, the seminal work in the "welfare magnet" literature, Peterson and Rom [1990], considered a model with regional fixed-effects and reached two conclusions that are consistent with previous work in the literature. First, Peterson and Rom found some evidence that interstate welfare differentials affect welfare recipiency, although their results were neither robust to specification nor (in most cases) valid at the 0.05 or 0.01 level of significance. Second, Peterson and Rom found overwhelming evidence that state welfare policy is driven by concern over welfare recipiency, which suggests that (whether or not high-benefit states actually act as "welfare magnets") states with relatively high benefits will act as if the "welfare magnet" problem is qualitatively significant.

The middle column of Tables 4.6 and 4.7 present results for the recipient and benefit equations under a regional fixed-effects framework; while these equations are estimated using a more comprehensive measure of the welfare benefit package and an improved econometric technique, they are analogous to previous work in the literature.[8] The results largely echo the conclusions of Peterson and Rom: the size of the welfare benefit package is significant at the 0.05 level, and a number of political variables become significant in the predicted direction. These results suggest that individuals do respond to interstate welfare differentials, and that welfare-related concerns play an important role in the determination of state public policy.

Since the policy implications derived from the state and regional fixed-effects models are fundamentally different, it is crucial to determine whether use of the state fixed-effects model can be econometrically justified. In separate tests, both state and regional fixed-effects are (in their respective frameworks) jointly significant, which suggests that some sort of fixed-effects framework is appropriate. In order to determine whether it is necessary to use state fixed-effects, however, it is necessary to test whether the coefficients of states within any single region are equal.

Table 4.9 does not provide a great deal of support for the regional fixed-effects hypothesis. The upper right quadrant of the graph, for example, contains states from the East, the Midwest, and California. Since a regional fixed-effects framework would not permit such a result, the regional fixed-effects framework would fail to capture variation for which a state fixed-effects framework could account. Equality tests confirm this result -- for every

[8]The precise model employed by Peterson and Rom is beset by both theoretical and empirical problems, but a reestimation of their model using the data set in this paper revealed qualitatively similar results.

region, the hypothesis that state fixed-effects are equal can be rejected at the 0.01 level, although equality of mountain-state coefficients (which appear from Table 4.9 to be the most similar) cannot be rejected at the 0.005 level. This finding suggests that the regional fixed-effects model is inappropriate, which supports the results of this paper but calls the conclusions of previous work into question.

4.11 Conclusion

In this paper, I have examined the issues of welfare recipiency and benefit determination. I have found some evidence that welfare generosity affects state welfare recipiency. I have found mixed evidence on the question of whether liberal public opinion and Democratic state governments induce higher welfare benefit packages. I have devised a test to overcome matching-rate difficulties but I have found little evidence that state governments respond to matching-rate effects. In addition, I have found that welfare recipients respond to amenity differentials and that labor-market conditions affect welfare recipiency.

The data used in this paper differs from previous work in at least two important respects. First, the data set is considerably more extensive than has been seen in the literature. The data set contains yearly observations from 1979 to 1991, which permits both more efficient estimation than previous work and an examination of dynamic effects that have been largely omitted from previous work. In addition, the welfare benefit package is measured more precisely than has been seen in the literature. By including the three largest welfare

benefit programs available to non-aged able-bodied adults, I have obtained a relatively broad measure of the welfare benefit package. In addition, I have resolved severe data questions with respect to Medicaid and I have accounted for problematic Food Stamp regulations.

There are several other respects in which this paper improves over past work. I have recognized that the political and migration/labor-leisure aspects of welfare recipiency are not independent and I have compensated for this fact in my estimation technique. I have also included measures of job-seeking and amenities in order to better capture the economic choices of the welfare population. Finally, I have considered a number of model specifications and found that many of the conclusions of this paper are sensitive to specification.

These results are interesting in light of the debate over welfare magnets and the nationalization of welfare policy. Proponents of redistribution argue for a uniform national benefit level in the United States on the grounds that, in a federal system, states that pursue social justice will become "welfare magnets" and will be compelled to curtail or eliminate redistributive activities. Oddly enough, opponents of redistribution argue against a uniform national benefit level in the United States on the same grounds -- that federalism rewards low-benefit states and penalizes high-benefit states. The findings of this paper suggest that welfare generosity affects welfare recipiency, but in a manner that is considerably more complex than has been considered by previous work. The central findings of this paper provide some support for the arguments of both ideological positions and call for a renewed examination of the normative justification of welfare programs as well as renewed research into the relationship between welfare generosity and welfare recipiency.

Appendix

Table 4.1: Real Benefit Levels, 1991 and 1979

The Bottom 10

State	1991	1979
MS	430.86	448.27
AL	448.71	495.45
TX	505.10	501.93
AZ	516.34	504.82
AR	524.76	535.88
TN	530.29	487.00
LA	539.99	513.62
SC	546.67	448.99
KY	547.82	581.12
WV	554.86	609.68

The Top 10

State	1991	1979
CA	793.15	783.60
MA	756.07	747.68
NY	754.01	874.71
VT	752.55	764.47
MN	736.08	765.60
OR	734.37	764.90
CT	716.15	734.46
ND	706.23	749.05
RI	705.76	704.21
DC	700.47	691.67
Mean	629.79	646.25
Variance	80.46	102.80

Note: Means and variances are for the entire 1991 and 1979 samples. All dollar amounts have been adjusted for inflation.

Table 4.2: Components of the Benefit Package, 1991

The Bottom 10

State	AFDC+FS	Medicaid	Total
MS	373.21	250.65	430.86
AL	381.49	292.24	448.71
TX	431.15	321.53	505.10
LA	440.93	430.69	539.99
TN	443.94	375.43	530.29
AR	450.71	321.97	524.77
SC	454.48	400.85	546.67
KY	479.31	297.88	547.82
NC	488.34	389.76	577.98
WV	497.37	249.99	554.86

The Top 10

State	AFDC+FS	Medicaid	Total
CA	742.46	220.40	793.15
VT	684.42	296.22	752.55
OR	663.44	308.41	734.37
MN	662.61	319.40	736.08
WI	660.50	160.09	697.32
MA	658.39	424.69	756.07
NY	648.07	460.63	754.01
CT	646.11	304.54	716.15
MI	640.94	222.78	692.18
WA	622.65	259.78	682.40
Mean	552.74	337.52	629.79
Variance	79.03	93.27	80.46

Note: Means and variances are for the entire 1991 sample. All dollar amounts have been adjusted for inflation.

Table 4.3: Intertemporal Data for Michigan and Wisconsin

Michigan

Year	Package	AFDC/FS	Medicaid
1979	821.09	757.44	276.74
1980	766.92	716.75	218.14
1981	757.88	706.77	222.21
1982	719.64	672.12	206.57
1983	704.02	658.06	199.82
1984	685.63	638.61	204.43
1985	689.68	648.03	181.08
1986	706.49	654.91	224.25
1987	693.66	643.97	216.05
1988	696.49	650.73	198.94
1989	690.52	641.73	212.14
1990	689.70	639.95	216.28
1991	692.18	640.94	222.78

Wisconsin

Year	Package	AFDC/FS	Medicaid
1979	787.09	741.05	200.19
1980	799.87	742.23	250.59
1981	777.87	719.20	255.09
1982	765.83	712.02	233.96
1983	785.14	733.73	223.50
1984	768.13	719.69	210.59
1985	766.08	729.31	159.89
1986	761.76	734.63	117.96
1987	743.77	714.66	126.57
1988	716.60	690.53	113.35
1989	711.07	670.54	176.25
1990	705.21	666.88	166.68
1991	697.32	660.50	160.09

Note: All dollar amounts have been adjusted for inflation.

Table 4.4: Intertemporal Data for Ohio and Indiana

Ohio

Year	Package	AFDC/FS	Medicaid
1979	620.72	572.31	210.46
1980	633.62	586.77	203.68
1981	609.10	562.26	203.64
1982	586.67	535.03	224.54
1983	597.10	542.44	237.63
1984	579.94	527.12	229.64
1985	595.02	537.27	251.12
1986	621.79	547.31	323.80
1987	614.46	542.63	312.32
1988	608.71	548.84	260.33
1989	603.08	535.14	295.38
1990	615.66	546.00	302.89
1991	624.79	552.64	313.69

Indiana

Year	Package	AFDC/FS	Medicaid
1979	631.18	580.03	222.39
1980	580.21	542.60	163.52
1981	593.15	552.94	174.84
1982	575.93	532.12	190.44
1983	595.43	534.03	266.94
1984	581.67	519.69	269.47
1985	583.21	519.57	276.69
1986	582.63	518.80	277.53
1987	569.57	506.34	274.91
1988	590.37	527.13	274.95
1989	603.46	514.40	387.19
1990	613.59	517.97	415.71
1991	626.00	517.22	472.97

Note: All dollar amounts have been adjusted for inflation.

Table 4.5: Variable Summary

Independent variable	Units	Mean	Var.
Benefit package	Dollars	611.30	92.03
Pregnancy subsidy	Dummy	0.20	0.40
Presumptive eligibility	Dummy	0.24	0.42
Welfare offices	Per capita	0.021	0.018
Job-seeking population	Thousands	324.76	373.87
Proportion of births to unmarried mothers	Percentage	21.51	8.28
F.B.I. Uniform Crime Index	Per capita	5156	1477
Sunlight	Percentage	59.31	8.98
Superfund sites	Per square mile	0.0007	0.0028
Hospitals	Per capita (1000)	0.037	0.017
Urban percentage	Percentage	66.76	21.83
Per capita income	Dollars	12548	2099
Welfare Families	Families	73274	100587
Recipiency Proportion	Log-odds	-2.90	0.41
Democratic presidential support	Percentage	0.44	0.09
Democratic state legislature	Dummy	0.61	0.48
Democratic governor	Dummy	0.60	0.49
Democratic state government	Dummy	0.37	0.48
Political influence	Percentage	0.43	0.08
Matching rate	Percentage	57.55	12.19
Local cost-shifting	Dummy	0.21	0.40
Local boards	Dummy	0.52	0.50
Local cost-shifting with local boards	Dummy	0.17	0.38
Birth difference - minorities and whites	Percentage	34.33	14.41
Unemployment rate	Percentage	6.75	2.20

Table 4.6: Recipient Results, Two-Stage Least Squares

	PROP-RE	FAM-SE	PROP-SE
Intercept	-3.8081**	414638.5**	-1.2122
	(0.3139)	(97415.4)	(0.7634)
Benefit Package (Instrument)	0.0021**	47.09	0.0001
	(0.0004)	(85.78)	(0.0001)
Pregnancy Subsidy	0.1223**	3120.44	0.0587*
	(1.3489)	(3647.76)	(0.0284)
Offices Per Capita	-0.0031**	488.16	0.0065*
	(0.0010)	(341.60)	(0.0027)
Presumptive Elig.	0.1177**		
	(0.0285)		
Job-seeking Pop.		43.50**	
		(6.78)	
Unemployment Rate	0.0615**		0.0202**
	(0.0064)		(0.0048)
Per Capita Income	-0.0642**	-4.10**	-0.1048**
	(0.0104)	(1.46)	(0.0119)
Unmarried Births	0.0041**	-22.28	0.0021**
	(0.0002)	(53.40)	(0.0004)
Crime Index	-0.033**	2968.69	0.0007
	(0.012)	(1675.93)	(0.0133)
Sunlight	-0.0080**		
	(0.0022)		
Hospitals Per Capita	-0.0015	-1894.43**	0.0017
	(0.0012)	(425.66)	(0.0331)

Superfund Sites	0.0206**	-1961.06**	-0.0118**
	(0.0048)	(563.95)	(0.0044)
Urban Percentage	0.1416	-4208.81**	-1.1583
	(0.0834)	(1112.91)	(0.8552)
Observations	624	624	624
Independent Var.	31	68	68
Adjusted R-squared	.79	.98	.94

Note: The log-odds of the recipiency ratio (PROP) is the dependent variable in the first and last columns of the table. The number of welfare families (FAM) is the dependent variable in the middle column.

Note: All models were estimated with time-series fixed-effects. In addition, the second and third columns were estimated with state fixed-effects (SE); the first column was estimated with regional fixed-effects (RE) but without state fixed-effects.

* denotes significance at the .05 level.
** denotes significance at the .01 level.

Table 4.7: Elasticities of the Recipiency Equation

Results are for a state with average welfare recipiency.

Variable	Change	Absolute	Relative
Pregnancy subsidy	Added	+0.31%	+ 5.54%
Welfare offices per capita	Doubled	+0.71%	+12.68%
Unemployment rate	+1% (absolute)	+0.11%	+ 1.92%
Average wage	+$1000 per year	-0.56%	- 9.92%
Unmarried births	+1% (absolute)	+0.11%	+ 2.00%
Superfund sites	Doubled	+0.04%	+ 0.78%

Note: Variables are taken from the last column of Table 6, and elasticities are calculated for a state with average welfare recipiency. Absolute changes are expressed in terms of the total population of a state; for example, an additional 0.31% of a state's population will enter the welfare rolls if the state chooses to institute a pregnancy subsidy. Relative changes are expressed in terms of the current recipient population of a state; for example, the welfare rolls will grow by 5.54% if the state chooses to institute a pregnancy subsidy.

Table 4.8: Benefit Results, Two-Stage Least Squares

	PROP-RE	FAM-SE	PROP-SE
Intercept	875.73**	552.99**	563.95**
	(68.18)	(55.67)	(115.47)
Matching Rate	1.00**	0.06	0.14
	(0.38)	(0.30)	(0.45)
Local Cost-Shifting	83.53**	-34.60	-27.34
	(12.11)	(18.31)	(21.86)
Local Boards	29.06**		
	(6.50)		
L.C.S.*L.B.	-94.67**	-13.84	-9.74
	(14.55)	(11.67)	(12.33)
D Governor	-19.33**	-4.59	-6.37
	(6.07)	(3.41)	(3.48)
D Legislature	-19.49**	-2.97	-3.22
	(7.20)	(4.06)	(4.16)
D Gov * D Leg	31.14**	6.72	8.87*
	(7.99)	(4.20)	(4.55)
Presidential D Pct.	1.14**	-1.72**	-1.68**
	(0.38)	(0.26)	(0.30)
Political Influence	1.84**	1.21**	1.66**
	(0.39)	(0.40)	(0.50)
Unmarried Births	-0.41**	0.24**	0.28*
	(0.05)	(0.08)	(0.14)
Unmarried Dif.	-0.15**	0.04	-0.06
	(0.02)	(0.04)	(0.04)
Unemployment Rate	-9.05**	1.20	1.88
	(1.61)	(0.98)	(1.78)

Welfare Families (Instrument)		0.0006** (0.0002)	
Recipiency Prop. (Instrument)	123.41** (13.54)		-8.95 (48.05)
Per Capita Income	0.0098** (0.0028)	0.0136** (0.0026)	0.0081 (0.0043)
Observations	624	624	624
Independent Var.	33	72	72
Adjusted R-squared	.78	.95	.95

Note: The log-odds of the recipiency ratio (PROP) is the dependent variable in the first and last columns of the table. The number of welfare families (FAM) is the dependent variable in the middle column.

Note: All models were estimated with yearly fixed-effects. In addition, the second and third columns were estimated with state fixed-effects (SE); the first column was estimated with regional fixed-effects (RE) but without state fixed-effects.

* denotes significance at the .05 level.
** denotes significance at the .01 level.

Figure 4.9: State Fixed-Effects Coefficients, Both Equations

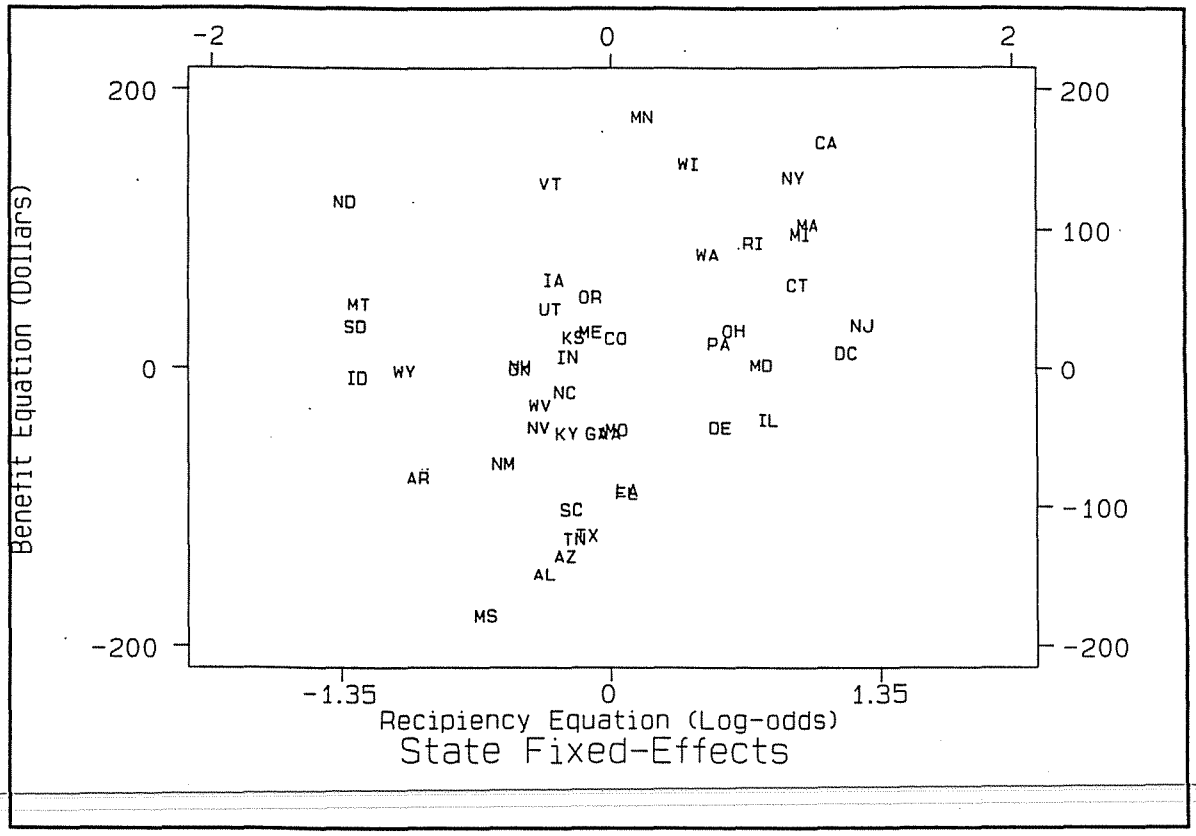

Table 4.10: Instrument Equations

	RECIPIENCY	BENEFIT
Intercept	593.97**	-2.68**
	(127.68)	(0.30)
Matching Rate	0.15	-0.0047**
	(0.32)	(0.0015)
Local Cost-Shifting	-32.51	-0.36**
	(18.49)	(0.09)
L.C.S.*Local Boards	-12.77	0.08
	(11.78)	(0.05)
D Governor	-7.34*	-0.0033
	(3.44)	(0.0175)
D Legislature	-7.11	-0.02
	(4.26)	(0.02)
D Gov * D Leg	9.01*	0.03
	(4.24)	(0.02)
Presidential D Pct.	-1.50**	0.0046**
	(0.28)	(0.0011)
Political Influence	1.30**	0.0049**
	(0.40)	(0.0016)
Unmarried Births	0.22**	0.0027**
	(0.08)	(0.0004)
Unmarried Dif.	-0.06	-0.0004**
	(0.03)	(0.0001)
Unemployment Rate	1.05	0.02**
	(1.04)	(0.01)
Per Capita Income	0.0097**	-0.0001**
	(0.0023)	(0.0000)
Pregnancy Subsidy	-12.02*	0.11**

	(5.30)	(0.02)
Offices Per Capita	154.23 (528.66)	3.75* (1.71)
Crime Index	4.05 (2.50)	0.01 (0.01)
Hospitals Per Capita	-1.10 (0.65)	0.0013 (0.0028)
Superfund Sites	-1.35 (0.84)	-0.0045 (0.0040)
Urban Percentage	168.41 (175.36)	0.24 (0.25)
Adjusted R-squared	0.96	0.94

Note: The first column was used to construct the welfare benefit package instrument for the recipiency equation. The second column was used to construct the recipiency proportion instrument for the benefit equation.

Note: Both equations were estimated with yearly and state fixed-effects.

* denotes significance at .05 level.
** denotes significance at .01 level.

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