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## Invited Article

# Welfare Reform and the Race to the Bottom: Theory and Evidence

Jan K. Brueckner\*

Economists have argued that welfare migration leads to a race to the bottom in the choice of welfare benefits. Although a system of federal matching grants can remedy this problem, the recent welfare reform law replaced the existing matching-grant structure with block grants, a policy change that appears undesirable. To judge whether this critique of welfare reform is justified, this paper evaluates the evidence in favor of a race to the bottom. After explaining the theoretical effects of welfare migration, the paper surveys the empirical evidence on the occurrence of such migration, concluding that the evidence is mixed. The discussion also considers recent empirical tests for strategic interaction, which show that benefit levels in nearby states affect a given state's benefit choice. The most plausible source of such interaction is a concern about welfare migration, which leads policymakers to look at benefits in neighboring states when making their own choices. Judging that the evidence appears consistent with the existence of a race to the bottom, the paper concludes that the demise of matching grants may be undesirable from a policy perspective.

## 1. Introduction

The passage of welfare reform in 1996 dramatically altered the rules governing the disbursement of aid to needy families. The most widely noted features of the new law are its work requirements, which tie the receipt of benefits to labor-force participation, and its imposition of limits on the duration of benefits (two years without work activity and a lifetime limit of five years). A less noted but still important feature of the reform act is a change in the rules that govern the size of the federal contribution to welfare spending. Previously, federal contributions were determined by open-ended matching grants, with individual states determining the level of welfare benefits and the federal government paying a fixed share of a state's total outlay.<sup>1</sup> Under the new system, each state receives a yearly lump sum from the federal government, whose magnitude is independent of the level of state contributions. The block grants for indi-

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<sup>1</sup> The federal share ranges from 50 to 83%, with the share depending on the per capita income level in a state.

vidual states were set initially to equal the 1994 level of federal matching-grant payments, and the grants are fixed in nominal terms for most states through the year 2002.<sup>2</sup>

Because of the new law's duration limits and work requirements, welfare spending is likely to fall as recipients are forced off the roles or leave voluntarily to enter the labor force. A further source of downward pressure on spending comes from the adoption of block grants. The reason for this pressure is that under a block-grant system, the state must pay 100% of each dollar of welfare costs beyond the federal contribution. Under matching grants, by contrast, the federal government covers part of each extra dollar of spending, lowering the "price" of welfare to the state. As is well known, this price effect means that state contributions to welfare spending will be higher under a matching-grant system even when the federal outlays under the two systems are the same, leading to higher total spending. Thus, the switch to block grants, viewed in isolation, should reduce total welfare spending. Surveying the evidence on the price sensitivity of welfare spending, Chernick and Reschovsky (1996) attempt to gauge the likely magnitude of this effect. They show that estimates in the literature are consistent with a benefit decline under block grants  $c^e$  between 10 and 85%, with their preferred magnitude lying in the 17–25% range.

Anticipating this downward pressure on benefits, policymakers included in the new law a "maintenance of effort" requirement, which stipulates that state contributions cannot be less than 80% of the 1994 level. However, a substantial 20% decline in benefits, consistent with Chernick and Reschovsky's predicted range, is required before this floor on benefits becomes binding. Moreover, the floor will become less restrictive over time as a result of a general rise in the cost of living.

Although the elimination of matching grants has raised the cost of additional welfare spending to the states, the new law's work requirements and duration limits may reduce the welfare system's unpopularity with taxpayers. The law also gives the states much more freedom in deciding how welfare funds will be spent. Under a matching-grant system, every expenditure eligible for matching must be defined with precision, a feature that may limit a state's ability to innovate. Some types of expenditures that turn out to be useful might not have been anticipated in the system's rules, making them inadmissible. Although waiver provisions under the old system provided some flexibility in changing its rules, innovation is fostered under a block-grant system because spending guidelines can be relatively loose.

Greater taxpayer support and increased spending flexibility resulting from the new law may make welfare programs more appealing to the states, and this could offset the negative spending impact of switching from matching grants to block grants. However, despite these potential advantages of the new law, economists have long argued that matching grants are superior as a system for distributing federal welfare funds to the states. These arguments suggest that the switch to block grants under welfare reform may not serve society's interest. The arguments claim that welfare spending tends to be too low and that a cost reduction such as that offered by a matching grant is needed to stimulate it. Two reasons for the spending shortfall are identified.

The first argument identifies interstate benefit spillovers as the reason for insufficient levels of welfare spending. The premise is that the well-being of all the nation's poor, regardless of their state of residence, is a concern of society's better-off members. Thus, in addition to caring

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<sup>2</sup> The law authorizes \$800 million per year to supplement block grants for those states with very low benefits or extremely rapid population growth, with the block grants allowed to rise slowly over time in these cases.

about the poor living within their own state, the altruism of the better off also extends to poor households in other states. The problem is that in choosing the level of welfare benefits, the better-off residents of a given state ignore the altruistic gains to their peers in other states from aid to the local poor. Because these external gains are ignored, welfare benefits are insufficiently generous, a conclusion that applies within each state. To ensure that benefits are properly set, matching grants are then required to stimulate state contributions. The existence of spillovers has also been used to argue for federal rather than state control of the welfare system (Oates 1972; Ladd and Doolittle 1982). However, if state control is taken as given, reflecting current institutional arrangements, then matching grants are needed to correct the effect of spillovers.

A second argument alleges that matching grants are needed to correct a distortion in state benefit choices caused by the phenomenon of welfare migration. Such migration occurs when welfare recipients move from low-benefit to high-benefit states to secure a better standard of living. To see the effect of welfare migration on benefits, consider the decision faced by a state's better-off residents as they contemplate an increase in the benefit level. These residents compare the altruistic gains from helping the poor to the increase in their tax burden. If the poor do not migrate, then the tax burden rises only because each of a fixed number of poor recipients receives a larger benefit. However, when welfare migration occurs, the size of the state's poor population grows as its welfare benefit becomes more generous. Because the higher benefit level per recipient is compounded by an increase in the number of poor households receiving benefits, the tax burden rises more rapidly than if the poor did not migrate. Generosity is thus more "costly" with welfare migration, and this leads the better-off residents to rationally select a lower level for the state welfare benefit. To avoid becoming a welfare magnet, each state is not as generous as it otherwise might be, an outcome that has been dubbed the "race to the bottom."

It is important to note that although this phrase provides a convenient shorthand description of the phenomenon of interest, it is likely to overstate the issue. The reason is that, in popular usage, a race to the bottom sometimes connotes a draconian tendency to slash welfare benefits to the bare minimum, mimicking the outcome in the least generous state. The theory, however, only points to a downward bias in benefits caused by a migration-induced escalation in the cost of providing welfare, without necessarily predicting such a dire outcome. In the subsequent discussion, "race to the bottom" should be understood as a shorthand for this downward bias and not as a reference to more extreme outcomes.

Because the concern about welfare migration depresses benefits in every state, no state succeeds in repelling the poor by keeping its benefits low, and each ends up being less generous than it would have been in the absence of migration. Put another way, states defend themselves against the in-migration of welfare recipients by choosing a benefit level lower than would have been chosen if the poor could not migrate. As in the case of benefit spillovers, the remedy for this outcome is a system of matching grants, which artificially reduces the cost of welfare spending, stimulating an increase in benefits.

Economists thus point to benefit spillovers and welfare migration as phenomena that justify the use of federal matching grants to support state welfare spending. If either of these phenomena is quantitatively important, then a key element of the welfare reform law may be undesirable. The theory suggests that instead of switching from matching to block grants, welfare reform should have left the matching-grant structure in place while relying on other changes in the law to restrict eligibility and to broaden the scope of the cost-sharing rules, encouraging innovation.

The purpose of this paper is to judge the validity of this conclusion by attempting to evaluate one of its underlying premises, namely the existence of a race to the bottom in the

provision of welfare benefits. This is done by considering two types of evidence. The first evidence is provided by empirical studies of welfare migration, which indicate whether or not welfare recipients move to high-benefit states. Evidence in favor of welfare migration would establish that the preconditions for a race to the bottom exist, namely a potential influx of migrants in response to generous welfare benefits. The relevant papers, which are discussed in section 3, are by Southwick (1981), Gramlich and Laren (1984), Blank (1988), Walker (1994), Levine and Zimmerman (1995), Enchautegui (1997), Borjas (1997), and Meyer (1998). The empirical evidence provided by these studies is mixed: Some studies find evidence of welfare migration, although the effect is sometimes small, while other studies show the absence of migration.

Rather than looking for preconditions for a race to the bottom, the second type of study tests directly for the kind of state behavior that leads to such an outcome. Specifically, the test looks for strategic interaction among states in the determination of welfare benefits, which arises when the welfare benefit level in a given state depends on benefits in nearby states. If a state is concerned about welfare migration, then benefit levels in neighboring states will affect its own benefit choice. Evidence of strategic interaction among the states thus provides indirect evidence that welfare migration affects policy decisions, suggesting that benefit choices may involve a race to the bottom.

It is important to realize that for strategic interaction (and thus the race to the bottom) to materialize, all that is required is a perception on the part of state governments that generous benefits attract welfare migrants. States may hold such a perception even in the absence of conclusive evidence on welfare migration. Because it focuses directly on the behavioral response that leads to a race to the bottom, which may arise even if welfare migration is mostly imaginary, a test for strategic interaction may be more useful than a test for migration itself. Section 4 discusses the papers that test for strategic interaction, most of which are still unpublished. These include Figlio, Kolpin, and Reid (1997), Peterson, Rom, and Scheve (1997), Smith (1997), and Saavedra (1998), as well as some related studies.

The empirical findings in these papers suggest that strategic interaction among the states does indeed occur. Even though the evidence on welfare migration itself is mixed, this direct behavioral evidence suggests that states are in fact playing a welfare game, which is most likely motivated by a concern about welfare migration. Therefore, this evidence suggests that actual choices of welfare benefits may involve a race to the bottom and that a corrective mechanism such as a matching-grant system may be needed.

It is important to realize that in reaching this conclusion, the paper offers no more than a conceptual critique of welfare reform and its block-grant component. The practical significance of this critique is very much an open question. For example, although the theory identifies a need for matching grants, the proper matching rates might be quite low if welfare migration (actual or perceived) is not substantial in quantitative terms. This conclusion, of course, would soften the verdict on block grants.

A further qualification is suggested by a recent *New York Times* article (Pear 1999), which indicates that the states currently are not using all of the federal block-grant funds to which they are entitled. This outcome is a response to the current economic boom, which, along with stricter eligibility requirements, has led to a dramatic decline in the welfare caseload. Under conditions in which federal funds go unused, the choice between block and matching grants is likely to be of little consequence, making the arguments in this paper largely academic. How-

ever, the structure of the grant system will become relevant again in the next economic downturn, when reliance on the welfare system will grow.

To motivate the discussion of the empirical evidence, the paper starts with a fuller presentation of the theory sketched above, showing that welfare migration depresses benefit levels and that a corrective system of matching grants is needed. This analysis, which is presented in section 2, follows Brown and Oates (1987) and Wildasin (1991), but related treatments have been presented by Smith (1991) and Wheaton (1997). With this theoretical background, the discussion then turns to the empirical evidence.

Before considering the theoretical model, it should be noted that some of the issues discussed in this study have been treated in a series of papers that analyze the assignment of income-redistribution responsibilities in a federal system. In addition to Oates (1972) and Ladd and Doolittle (1982), these papers include Craig and Kohlhase (1985), Gramlich (1985), Peterson and Rom (1988), and McGuire (1991, 1997).

## 2. Theory

### *Welfare Migration*

To illustrate the effect of welfare migration on benefit levels, consider the following simple model, adapted from Brown and Oates (1987) and Wildasin (1991). Let the economy contain two states, denoted 1 and 2. Each state contains  $M$  nonpoor consumers, referred to as the rich, who are immobile across states. This immobility simplifies the analysis, but it precludes the out-migration of the rich in response to a high tax burden, which may be a factor in some fiscal decisions.<sup>3</sup> The economy contains  $2\bar{N}$  poor consumers, who work at low-paying jobs as well as receive welfare benefits from the state where they reside. The poor are assumed to be mobile across states, with  $N_1$  and  $N_2 = 2\bar{N} - N_1$  given the poor populations in states 1 and 2, respectively.

The incomes of the poor are determined in a competitive labor market and thus reflect the marginal productivity of unskilled labor. Suppose that state output  $f(N)$  depends on the amount  $N$  of unskilled labor along with other fixed factors, which may include land and capital. The unskilled wage is then given by  $w(N) \equiv f'(N)$ , where  $f'$  is the marginal product. Because  $f$  is concave, the wage falls as the unskilled labor pool grows, with  $w'(N) = f''(N) < 0$ . Wages in states 1 and 2 are thus  $w_1 = w(N_1)$  and  $w_2 = w(N_2)$ , and letting  $T_1$  and  $T_2$  denote the welfare benefits paid to the poor, the total income of a poor resident equals  $w(N_1) + T_1$  in state 1 and  $w(N_2) + T_2$  in state 2.

Assuming that migration costs are zero, migration equilibrium is achieved when poor income is equalized between the two states. If incomes were not equal, poor residents would move from the low-income to the high-income state, and the marginal product of unskilled labor would fall in the latter state and rise in the former until income equality is achieved. The migration equilibrium condition is thus  $w_1 + T_1 = w_2 + T_2$ , which may be rewritten as

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<sup>3</sup> Because welfare expenditures represent a relatively small portion of state budgets, rich consumers would be unlikely to relocate to escape the tax burden associated with generous benefits, justifying the immobility assumption. Such relocation might be an issue, however, in choice of state income or sales tax rates, where the impact is larger. In any case, because the rich themselves choose the welfare benefit in the present model, the incentive to relocate doesn't arise.

$$w(N_1) + T_1 = w(2\bar{N} - N_1) + T_2, \quad (1)$$

where  $N_2$  has been eliminated.

By making state 1 more attractive, an increase in  $T_1$  causes welfare migrants to flow from state 2 to state 1, raising  $N_1$ . Conversely, an increase in  $T_2$  causes reverse migration, reducing  $N_1$ . This can be seen formally by differentiating Equation 1, which yields

$$\frac{\partial N_1}{\partial T_1} = -\frac{1}{w'(N_1) + w'(2\bar{N} - N_1)} > 0; \quad \frac{\partial N_1}{\partial T_2} = -\frac{\partial N_1}{\partial T_1} < 0, \quad (2)$$

where  $w' < 0$  is used.

In this setup, wage adjustment is the force that equilibrates migration flows, an assumption that follows Wildasin (1991). Without such an equilibrating force, a disruption of the equilibrium condition, Equation 1, caused by an increase in  $T_1$  or  $T_2$  would lead all the poor to move to one state or the other. With offsetting wage movements, however, the equilibrium condition is restored before this extreme allocation is reached. It should be noted that other equilibrating mechanisms are also considered in the literature. Smith (1991) assumes that wages are fixed but that the poor have idiosyncratic moving costs, which vary across individuals. Starting in equilibrium, if the welfare benefit in one state increases, those poor individuals whose moving costs are less than the new income differential relocate to that state, while the rest of the poor stay put. Using another approach, Wheaton (1997) assumes that individuals have idiosyncratic preferences for particular states, reflecting unobserved personal characteristics. If these idiosyncratic elements, which are manifested in a random utility term, have the proper probability distribution, then the allocation of the poor across states follows the multinomial logit model. Once again, an increase in one state's welfare benefit leads to in-migration of the poor, but locational preferences choke off migration before other states lose their entire populations. Note that because wage adjustment plays no role in either of these equilibration mechanisms, labor force participation by the poor can be dropped as an assumption, with unemployment assumed instead. Although this approach might seem more realistic than one in which welfare recipients are assumed to earn labor income, MaCurdy and O'Brien-Strain (1997) show that such earnings are in fact significant for many welfare households. Therefore, the present framework is not unrealistic, and it has the advantage of being easy to manipulate.

### *Choice of Benefit Levels*

The level of each state's welfare benefit is chosen by its rich residents, who care about the well-being of the local poor.<sup>4</sup> The rich in both states have the same utility function, which is written  $U(x_i, w_i + T_i)$ ,  $i = 1, 2$ , where  $x_i$  gives consumption expenditure for the rich in state  $i$ . Note that the rich care about the total income of a representative poor resident,  $w_i + T_i$ , which depends on wage income as well as the welfare benefit. Letting  $y$  denote the income of the rich, which is the same in both states, the budget constraint of a rich resident in state 1 is then given by

$$x_1 + \frac{N_1 T_1}{M} = y, \quad (3)$$

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<sup>4</sup> Because only local poor matter, spillovers are implicitly ignored.

with an analogous constraint applying in state 2.<sup>5</sup> Note that the welfare cost for each rich resident equals the total outlay,  $N_1 T_1$ , divided by the number of rich,  $M$ .

The rich in state 1 choose  $T_1$  to maximize utility subject to the budget constraint, Equation 3. To simplify the discussion, suppose that the rich utility function is quasi-linear, so that  $U(x_1, w_1 + T_1) \equiv x_1 + V(w_1 + T_1)$ , where  $V''(\cdot) < 0$ . Then, using Equation 3 to eliminate  $x_1$ , the goal of the rich is to maximize  $y - N_1 T_1 / M + V(w_1 + T_1)$ .

To analyze this problem, suppose first that the poor were immobile and evenly divided between states, with  $N_1 = \bar{N}$ . Under this assumption, the first-order condition for the utility maximization problem is

$$MV'(w_1 + T_1) = \bar{N}, \quad (4)$$

where  $w_1 = w(\bar{N})$ . This equation has the form of a Samuelson condition for optimal provision of a public good. To see this, note that  $MV'$  is the sum across rich residents of the marginal gain from increasing  $T_1$ , while  $\bar{N}$  is the marginal cost of increasing  $T_1$  (the total outlay on welfare increases by  $N_1 = \bar{N}$  when  $T_1$  rises by a dollar).

Now consider the case in which the poor are mobile. In this case, the rich in state 1 choose the welfare benefit, taking account of the fact that an increase in  $T_1$  raises  $N_1$  through migration. The states play a Nash "welfare game," with the rich in state 1 viewing state 2's welfare benefit,  $T_2$ , as fixed in making their own choice. The first-order condition for this problem is

$$MV'(w_1 + T_1) = \frac{N_1 + \frac{\partial N_1}{\partial T_1} T_1}{1 + w'(N_1) \frac{\partial N_1}{\partial T_1}}, \quad (5)$$

where  $w_1 = w(N_1)$ . Although the left-hand side of Equation 5 again equals the sum of the marginal gains from an increase in the income of the poor, the right-hand side (RHS) differs from Equation 4 because of the effects of migration. The numerator of this expression gives the increase in total welfare outlays from an increase in  $T_1$ . The  $N_1$  term again captures the effect of the higher benefit per recipient, while the  $(\partial N_1 / \partial T_1) T_1$  term (which is positive from Equation 2) captures the effect of a larger poor population. The presence of this extra term means that outlays rise faster with an increase in  $T_1$  than in the immobility case, making the marginal cost of raising  $T_1$  larger.

To understand the denominator of Equation 5, note that in the immobility case, increasing the welfare benefit by a dollar raises the income of the poor by a dollar. The impact on income is lower, however, when the poor migrate. The reason is that the wage falls as additional poor move into state 1, offsetting the effect of the higher  $T_1$ . This effect is captured by the denominator expression. Since  $w'(N_1) < 0$ , the denominator is less than one but greater than zero, as can be seen by substituting for  $\partial N_1 / \partial T_1$  using Equation 2. Therefore, a dollar increase in  $T_1$  raises  $w_1 + T_1$ , but does so by less than a dollar. Migration of the poor thus reduces the "productivity" of welfare benefits in raising poor incomes.

The effect of welfare migration on benefit levels can be deduced using the above infor-

<sup>5</sup> Wildasin (1991) assumes that the rich residents capture the return to the fixed factors of production, which equals  $f(N_1) - N_1 f'(N_1)$ . Since this expression divided by  $M$  gives rich income per capita, it follows that the income of the rich changes along with the poor population. Adding this effect to the model makes the analysis more complex without changing its main implications.



mation. From above, the numerator of Equation 5 exceeds  $N_1$ , reflecting the higher marginal cost of raising  $T_1$  when the poor migrate, while the denominator of Equation 5 is less than one, reflecting the lower productivity of welfare benefits. It follows that the RHS of Equation 5 exceeds  $N_1$ . But because the poor will be evenly divided between the states in equilibrium,  $N_1 = \bar{N}$  must hold in Equation 5. As a result, the RHS of Equation 5 is larger than  $\bar{N}$  and thus larger than the RHS of Equation 4. This means that the marginal cost of achieving a dollar's increase in the income of the poor through welfare benefits, as reflected in the size of the RHS expression, is larger in the presence of welfare migration. It follows the chosen  $T_1$  is smaller with welfare migration than when the poor do not migrate.<sup>6</sup>

As noted above, a key feature of the equilibrium is that the poor are evenly divided between the states, just as in the immobility case. Because the poor end up evenly divided despite state concerns about welfare migration, it is clear that these concerns distort the choice of benefits for no good reason. Thus, the outcome with welfare migration is inefficient. The socially optimal benefit level in each state corresponds instead to the one chosen in the immobility case. This benefit level maximizes the utility of each state's rich residents, conditional on an equal division of the poor across states.

Because welfare migration is the source of this inefficiency, a ban on migration of the poor could correct the problem, leading to socially optimal benefit levels. However, such a policy intervention is repugnant and, in any case, impossible in a free society. A more palatable means of achieving the social optimum would be to institute a system of matching grants. Under such a system, the federal government would pay a fraction  $\theta$  of state welfare costs. Rich utility in state 1 would then be given by  $y - (1 - \theta)N_1T_1/M + V(w_1 + T_1)$ , and the multiplicative factor  $(1 - \theta)$  would appear on the RHS of the first-order condition (Eqn. 5). Since this factor makes the RHS smaller, proper choice of  $\theta$  can ensure that the expression equals  $\bar{N}$  in equilibrium. Condition 5 then becomes equivalent to Equation 4, so that the chosen benefit levels are the same as in the immobility case. Therefore, while welfare migration raises the cost of helping the poor, matching grants can reduce this cost to the level that would prevail if the poor did not migrate, leading to socially optimal benefit levels.

It might appear that the same increase in welfare spending could be achieved by block grants, which would effectively raise the income of the states and thus increase the willingness of well-off households to support the poor. The problem, however, is that the tax revenue used to finance block grants comes from the state residents themselves via the federal income tax. As a result, block grants in the case with identical states are a wash, having no effect on average disposable income of state residents, and thus no effect on welfare spending.<sup>7</sup> By contrast, even though matching grants are also financed by federal tax revenue, the money is returned to the states in a manner that reduces the "price" of welfare. As a result, matching grants lead to higher welfare spending, even though the funds come from the state residents' own pockets.

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<sup>6</sup> To see this more precisely, observe that the wage terms that appear inside  $V'(\cdot)$  on the left-hand sides of Equation 4 and Equation 5 are equal, given by  $w'(\bar{N})$ . Since the RHS of Equation 5 is larger than the left-hand side of Equation 4 regardless of the value of  $T_1$ , it follows (recalling  $V'' < 0$ ) that the  $T_1$  that satisfies Equation 5 must be smaller than the value that satisfies Equation 4. Note also that if wages were fixed (as under the other equilibration mechanisms discussed above), then the denominator of Equation 5 would equal one and the only source of the suboptimal benefit level would be the higher marginal cost of raising  $T_1$ .

<sup>7</sup> Because states are not identical in reality, block grants will generate some interstate redistribution, which may affect the average level of welfare spending.

### Reaction Functions

Another way of representing the equilibrium with welfare migration is through the reaction functions of the two states. State 1's reaction function gives the best value of  $T_1$  conditional on the benefit level,  $T_2$ , chosen in state 2, while state 2's reaction function gives the best level of  $T_2$  conditional on  $T_1$ . Equilibrium requires that the states' choices are mutually consistent, in the sense that each benefit level is optimal given the other. The benefit levels with this property correspond to the intersection point of the reaction functions.

State 1's reaction function is implicitly defined by the first-order condition (Eqn. 5). To see this, note that  $N_1$  depends on both  $T_1$  and  $T_2$  via Equation 1, so that the RHS of Equation 5 involves both benefit levels. In principle, Equation 5 can then be rewritten to give  $T_1$  as a function of  $T_2$ , yielding state 1's reaction function.

Because the empirical work discussed in section 4 involves estimation of reaction functions, it is useful to derive such a function for a particular case. To do so, assume that the production function  $f$  is quadratic, so that  $f'(N_1)$ , and hence  $w(N_1)$ , is given by the linear function  $\alpha - \beta N_1$ , where  $\alpha, \beta > 0$ . Assume that the  $V$  portion of the utility function is also quadratic, so that  $V'(w_1 + T_1) = \eta - \delta(w_1 + T_1)$ , where  $\eta, \delta > 0$ . Substituting the linear  $f'$  in Equation 1 and solving for  $N_1$  yields  $N_1 = \bar{N} + (T_1 - T_2)/2\beta$ . This equation shows that state 1's poor population is increasing in  $T_1$  and decreasing in  $T_2$ , as noted in Equation 2. Using this equation to substitute for  $N_1$  and  $\partial N_1/\partial T_1$  in Equation 5 and substituting the expression for  $V'$ , the equation can be rewritten as

$$T_1 = \Phi + \frac{1 - \beta\delta M}{2 + \beta\delta M} T_2, \quad (6)$$

where  $\Phi$  is a constant. Equation 6 gives state 1's reaction function, and state 2's function is obtained by interchanging  $T_1$  and  $T_2$ . The intersection of these two reaction functions yields the common equilibrium value of  $T_1$  and  $T_2$ , which is again too low from society's point of view.

The reaction function in Equation 6 is linear, and it may slope up or down depending on parameter values. The function is upward sloping if  $1/\beta > \delta M$ , with state 1 raising  $T_1$  in response to an increase in  $T_2$ . For this condition to hold, the  $\beta$  parameter from the production function must be small relative to the  $\delta$  parameter from the utility function.<sup>8</sup> Conversely, the function is downward sloping if  $1/\beta < \delta M$ , with state 1 reducing its welfare benefit in response to an increase in  $T_2$ . The slope is zero only in the knife-edge case where  $1/\beta = \delta M$ . Except in this case, state 1's best choice for  $T_1$  depends on state 2's benefit level, indicating the existence of strategic interaction between the states in their choice of welfare benefits.

A way of testing for strategic interaction would be to estimate a regression equation relating state welfare benefits to benefit levels in nearby states, as well as other explanatory variables. If strategic interaction occurs, then the regression coefficient on other-state benefits would be nonzero. By contrast, suppose that concern about welfare migration played no role in benefit choices, either because the extent of migration is inconsequential or because states ignore its effect in choosing benefit levels. Then, as in the immobility case considered above, state 1

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<sup>8</sup> The slope depends on how an increase in  $T_2$  affects the marginal utility from an increase in  $T_1$  (i.e., the total derivative of utility with respect to  $T_1$ , taking migration effects into account). If this marginal utility is increasing in  $T_2$ , then the reaction function slopes up. Otherwise, it slopes down. As seen in the above inequality, the first case applies if the decline of the marginal product of labor as  $N_1$  increases (measured by  $\beta$ ) is small relative to the decline in the marginal utility from helping the poor as  $w_1 + T_1$  rises (measured by  $\delta$ ). The second case applies otherwise.

would set  $T_1$  without regard to the level of  $T_2$ . In the above regression equation, this independence would lead to a zero coefficient for the other-state benefit variable, indicating the absence of strategic interaction.

A test for strategic interaction thus provides indirect evidence of whether welfare migration affects benefit choices. The absence of interaction indicates that welfare migration is not a factor. Although evidence of strategic interaction would not prove conclusively that welfare migration is a concern of policymakers, this concern is the most plausible source of a finding that other-state benefits matter in a given state's benefit choice.<sup>9</sup> Thus, evidence of strategic interaction suggests that states behave in a way that leads to a race to the bottom, indicating a need for policy intervention to raise benefit levels.

It is important to realize that this conclusion is independent of the direction of strategic interaction, as reflected in the slope of the estimated reaction function. In other words, a race to the bottom emerges regardless of whether a given state raises or lowers its welfare benefit in response to an increase in the other state's benefit level. Technically, the reason is that Equation 5, which yields low benefits, applies regardless of whether the reaction function slopes up or down. The intuitive reason is that benefit choices are distorted by the migration-induced increase in the cost of welfare provision, regardless of whether states respond positively or negatively to their neighbors.

Thus, from an empirical point of view, concern about welfare migration means that benefit levels in other states are relevant, but it does not predetermine the direction of the interaction. As a result, the critical empirical issue is whether the slope of the estimated reaction function is nonzero. Such a finding suggests that welfare migration is a concern of the states and that a race to the bottom is likely.

### **3. Empirical Studies of Welfare Migration**

The theory of section 2 predicts a race to the bottom as states limit the generosity of welfare benefits in response to welfare migration. To decide whether this prediction is of practical importance, the validity of the underlying premise, namely the existence of welfare migration, must be evaluated. A number of empirical studies have looked for evidence of welfare migration, and the purpose of this section is to provide a detailed description of their findings. The studies are by Southwick (1981), Gramlich and Laren (1984), Blank (1988), Levine and Zimmerman (1995), Walker (1994), Enchautegui (1997), Borjas (1997), and Meyer (1998). The results of these studies are described sequentially in the following discussion, where the goal is mainly to provide a catalog of findings. The discussion does not attempt to carry out a critical evaluation of each study, a task that is largely unneeded because the research is all of good quality and thus free of major flaws.

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<sup>9</sup> In models of "yardstick competition," state residents look at expenditures in nearby states to evaluate whether their state government is wasting revenue and deserves to be voted out of office (see Besley and Case 1995). Because self-interested government officials choose expenditures knowing that residents make such comparisons, strategic interaction among states arises. It could be argued that the yardstick approach also applies to welfare benefits, with residents comparing benefits in nearby states to judge whether the local benefit level is justifiable. However, this source of strategic interaction seems less plausible than a concern about welfare migration.

### *The Southwick Study*

Southwick (1981) presents the earliest credible study of welfare migration. He uses data drawn from a 1967 study of the Aid to Families with Dependent Children (AFDC) program and presents several different tests for welfare migration. The most convincing test considers the migration of female AFDC recipients between different regions, consisting of the nine census divisions into which the U.S. is partitioned. For a given pair of census divisions (denoted A and B for concreteness), Southwick computes the following information: the number of female AFDC recipients living in division A in 1967 who were born in division B and the total number of 1967 residents of division A who were born in division B. He then divides the first number by the second, which yields the fraction of migrants from B to A that are welfare recipients.<sup>10</sup>

The difference between maximum welfare benefits for a family of four between divisions A and B is then computed, averaging across states within each division. The expectation is that the greater the benefit differential between divisions A and B, the larger will be the share of welfare recipients among total B-to-A migrants. This procedure is repeated for each possible pair of census divisions, yielding 72 observations. The welfare recipient share is then regressed on the benefit-differential variable, and the estimated coefficient is positive and statistically significant, as expected. This shows that migration between census divisions where the benefit differential is large consists disproportionately of female AFDC recipients, providing evidence that welfare migration occurs. This conclusion is reinforced by the fact that a variable measuring the employment–earnings differential between divisions has no effect on the dependent variable, an outcome that would be expected if migration of AFDC recipients is uninfluenced by earnings prospects in the labor market.

### *The Gramlich–Laren Study*

Gramlich and Laren (1984) start with a theoretical model similar to the one presented in section 2. In the model, the rich residents of a state choose the welfare benefit taking into account that the recipient population rises as the benefit becomes more generous. The goal is to estimate the parameter  $b$  that determines the responsiveness of migration to an increase in the benefit level. This parameter helps determine the “price” of welfare to the rich, and this price in turn influences the level of benefits through a benefit “demand function.”

To derive an estimating equation, the price expression (which contains the  $b$  parameter) is substituted into a constant elasticity form of the benefit demand function. Benefits then depend on variables such as state income (a demand shifter) and the federal matching rate (which helps determine price), but the coefficients of these variables are nonlinear functions of the underlying parameters, including  $b$ . Therefore, the  $b$  estimate must be computed indirectly from the regression coefficients.

The regression is estimated using panel data at the state level from 1974 to 1981. The results yield a positive estimate of the migration parameter  $b$ , but given that the estimate is computed indirectly, Gramlich and Laren do not present its standard error. Therefore, it is impossible to judge whether the estimated migration effect is significantly different from zero.

Taking an entirely different approach, Gramlich and Laren also compute a transition matrix showing the probability of migration by AFDC recipients among states offering low, medium,

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<sup>10</sup> This procedure involves the implicit assumption that AFDC recipients in 1967 were always on welfare, which may be illegitimate (i.e., AFDC recipients could have arrived in the state before entering the welfare roles).

and high welfare benefits. Using information on the states of residence in 1975 and 1979 for a sample of welfare recipients (taken from the Panel Study of Income Dynamics), the probability of each type of transition is computed (i.e., low-benefit state to high-benefit state, middle-benefit state to low-benefit state, etc.). The results show that transitions that reflect welfare migration (i.e., toward high-benefit states) are more likely for welfare recipients than the reverse types of transitions (toward low-benefit states). While this evidence is suggestive, no statistical tests are presented.

### *The Blank Study*

Blank (1988) analyzes migration across states by female-headed households with children, using 1979 data from the Current Population Survey. She divides the country into 12 regions and computes expected wage income, as well as the expected welfare benefit, in each region for a typical poor household. The location and welfare status of each household in 1979 is then viewed as the outcome of a choice among 24 alternatives: region of residence and whether or not to receive welfare benefits as a resident of the given region. One of the choices corresponds to the decision not to migrate, with the household remaining in the region where it resided in 1975. Accordingly, the explanatory variables include distance measures, which indicate the migration distance to each region relative to the household's 1975 location.

This choice setting generates a multinomial logit model. The estimated coefficients show that both expected wage income and welfare benefits have a significant influence on the location decisions of female-headed households, as does migration distance. The findings show that wage income exerts a stronger influence on location than do benefits, as would be expected given that welfare recipients make up only half the sample. However, the fact that welfare benefits affect the location decisions of female-headed households indicates that welfare migration does indeed occur.

Blank conducts several simulations to appraise the strength of this effect. For example, she analyzes the effect on mobility of equalizing welfare benefits across the nation at a level equal to the 1979 average. If this were done, the probability that a female-headed household residing in the New York region in 1975 still lives in New York in 1979 falls from 92 to 86%. This decline shows the effect of cutting New York's high welfare benefit to the national average level, which spurs out-migration of female-headed households. Conversely, the probability that a household residing in Texas in 1975 remains there in 1979 rises from 85 to 92%. This increase shows the effect of raising Texas's low benefit level, which restrains the out-migration of female-headed households.

### *The Levine–Zimmerman Study*

Levine and Zimmerman (1995) use 1979–1992 data from the National Longitudinal Study of Youth to study welfare migration. They focus on the decisions of poor households to leave their state of residence. The approach is to ask whether a high level for the local welfare benefit has a differential effect on the relocation decisions of poor female-headed households with children (the treatment group) as compared with other households not likely to receive welfare (the control group). The expectation is that a high benefit limits the out-migration of members of the treatment group while having no effect on members of the control group. Levine and Zimmerman experiment with several different control groups, one of which consists of poor single women without children, who are not potential welfare recipients.

Using data on individual decisions, Levine and Zimmerman estimate a probit equation, where the dependent variable is one if the household relocated and zero otherwise. The equation includes a dummy variable indicating membership in the treatment group, which captures general differences in mobility between the treatment and control groups. The welfare-benefit level prior to any move also enters as a separate variable. However, the key variable that allows a test for welfare migration is an interaction term equal to the product of the welfare-benefit variable and the treatment group dummy. If high welfare benefits restrain the migration of poor female-headed households without affecting the control group, then the coefficient of this variable should be negative.

Levine and Zimmerman's empirical results contradict this expectation, showing that the key interaction variable has a statistically insignificant coefficient. This conclusion also emerges in several additional specifications of their model. Therefore, their results suggest that welfare migration does not occur.

### *The Walker Study*

Using 1980 data, Walker (1994) follows an approach similar to that of Levine and Zimmerman. Focusing on county-to-county migration, he divides the number of poor, young, female migrants by the number of migrants in a control group consisting of poor, young men. This ratio is the dependent variable in a regression that includes the welfare-benefit differential between the origin and destination counties as an explanatory variable, along with other variables measuring intercounty differences. In a variety of specifications, the benefit-differential variable always has a statistically insignificant coefficient, showing the absence of welfare migration. Although this finding matches the results of Levine and Zimmerman (1995), Walker's procedures are open to criticism on several counts.<sup>11</sup>

### *The Enchautegui Study*

Enchautegui (1997) follows an approach similar to that of Blank (1988), using census public use micro sample data. She investigates whether interregional differences in wages and welfare benefits affect the migration decisions of single women with young children. In the empirical framework, migration over the 1975–1980 period depends on 1980 wage and welfare-benefit differentials between regions, as well as other variables. Enchautegui divides the country into 16 regions, but instead of using Blank's multinomial logit approach, each pairwise migration choice (involving the original region and some other candidate region) is treated as a separate decision, leading to a probit regression.

The results show that welfare-benefit differentials have the predicted positive effect on migration, a conclusion that is highly robust across different specifications of the model. An important auxiliary finding is that the migration effect is stronger for single women with no

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<sup>11</sup> To generate county pairs between which migration is computed, Walker (1994) focuses on three welfare magnet states: Wisconsin, Michigan, and Virginia. Border counties in these states, as well as border counties in the contiguous states, are eligible for inclusion in the sample. Migration flows between each pair of contiguous counties in this set constitute the data to be explained (the pairs include counties in the same state as well as those straddling a state border). Although this procedure involves a fine level of spatial detail, it appears to exclude the important migration flows of the poor between major cities, which are usually not located in border counties. In addition, unlike the Blank (1988) and Levine–Zimmerman (1995) studies, the study does not restrict its focus to the most obvious welfare candidates: female-headed households with children (the treatment group includes poor, young women, with and without children).

recent work history. Although the qualitative effect matches predictions, its quantitative magnitude is relatively small. A 10% increase in AFDC benefits in each destination region raises the probability of migration only from 9.1 to 9.3%.

### *The Borjas Study*

Borjas (1997) argues that the effect of welfare benefits on household location should be especially transparent in the case of recent immigrants, whose choice of a state of residence is free of the locational inertia felt by native households. In part of his study, Borjas focuses on the frequency with which different types of households reside in California, where the benefit level is high relative to most other states. Summary data show that in 1990, California was home to 9.6% of native households who did not receive welfare and 11.6% of households who were welfare recipients. By contrast, among recent migrant households, 28.9% of those who did not receive welfare lived in California, and 45.4% of those on welfare lived in the state. The much larger differential in the numbers for recent migrants suggests that welfare recipients among this group are disproportionately drawn by California's high benefit level, as expected. This finding persists in a regression that controls for the characteristics of individual households.<sup>12</sup>

### *The Meyer Study*

Meyer (1998) combines elements of the Blank (1988) and Levine and Zimmerman (1995) approaches, using PUMS data for 1980 and 1990. Although he experiments with several simpler methodologies, his major results come from a multinomial logit model related to the one estimated by Blank (1988). In the model, migration among six regions depends on interregional wage and welfare-benefit differentials. However, instead of estimating this model for a sample of female-headed households with children, Meyer includes both single mothers and single women without children, allowing the benefit-differential coefficient to differ between the two groups via an interaction effect, as in Levine and Zimmerman (1995). He finds that single mothers migrate more readily in response to higher welfare benefits than do single women without children, confirming the presence of welfare migration. However, as found by Enchautegui (1997), the relevant magnitudes are small, with a \$1000 increase in the annual welfare benefit raising migration of single women to a region by only about 6% over a five-year period.

### *Implications*

As can be seen from the above discussion, the verdict of the empirical studies is mixed. Although Southwick (1981), Blank (1988), Borjas (1997), Enchautegui (1997), and Meyer (1998) provide evidence that welfare migration occurs, the two latter studies find that its magnitude is small. Moreover, the results of Walker (1994) and Levine and Zimmerman (1995)

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<sup>12</sup> Taking a different approach, Borjas (1997) also shows that an increase in a state's benefit level raises the probability that a household receives welfare by more for recent immigrants than for native households. This finding is also consistent with the clustering of recent immigrants in high-benefit states.

show no evidence of welfare migration.<sup>13</sup> It could be argued that the Blank and Meyer studies offer the most convincing evidence, given that they use individual data on households with children and control for benefit levels at both the origin and destination of the potential migrant, relying on an appropriate multinomial logit framework. However, the small effects estimated by Enchautegui and Meyer, along with the countervailing evidence provided by the Walker and Levine–Zimmerman studies, point to a mixed conclusion that is at best mildly positive in favor of the hypothesis of welfare migration.

Given the mixed empirical findings, actual state behavior in dealing with poor migrants can provide independent evidence on the phenomenon of welfare migration. States historically have attempted to deny or limit welfare benefits to recent migrants, and this evidence is suggestive. Such attempts indicate that, despite the mixed empirical findings, policymakers appear to believe that welfare migration occurs, and they attempt to limit its extent by restricting recent migrants' access to welfare benefits.

In the 1960s, some states imposed severe restrictions by denying any welfare benefits to poor migrants over a waiting period as long as one year. Such restrictions were struck down by the Supreme Court in 1969, but states responded by instituting two-tier benefit schemes. Under one approach, the benefit paid to new migrants during the waiting period corresponds to the benefit level in their state of origin, which is presumably lower than in the new state of residence. The best known scheme of this type was instituted in Wisconsin, presumably to deter welfare migration from the less generous (and adjacent) state of Illinois. However, a 1999 Supreme Court decision struck down the two-tier schemes, preventing the states from imposing any limit on benefits paid to new migrants.

The past attempts to impose benefit restrictions provide strong evidence that welfare migration is a concern of policymakers. However, if the unfavorable empirical findings are valid, so that welfare migration does not occur or has a small magnitude, then such behavior is based on a fundamental misperception. Regardless of which view is correct, the important observation is that policymakers act as if welfare migration were important. This behavior in turn is likely to generate a race to the bottom, leading to suboptimal benefit levels whether or not welfare migration is quantitatively significant.

#### **4. Evidence on Strategic Interaction Among the States**

##### *The Principal Studies*

Another way to test for the behavior that leads to a race to the bottom is to look for evidence of strategic interaction among states in the determination of welfare benefits. This section reviews the evidence on strategic interaction, focusing on the results of Figlio, Kolpin, and Reid (1997), Peterson, Rom, and Scheve (1997), Smith (1997), and Saavedra (1998).

As explained above, a test for strategic interaction is based on a regression equation relating

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<sup>13</sup> Because the Gramlich–Laren (1984) study does not provide a significance test for the migration parameter, its results are less compelling. This conclusion also applies to the study of Peterson and Rom (1989), who study welfare migration by regressing the five-year change in a state's poverty rate on the welfare benefit level, finding the expected positive relationship. Although the benefit level is properly treated as endogenous, a drawback of this approach is that the change in the poverty rate is a very imprecise measure of welfare migration. Because the incidence of poverty depends largely on local economic conditions, it is likely that its variation is mostly independent of the extent of migration.



the welfare benefit level in a state to its economic and demographic characteristics, and to benefit levels in other states. A nonzero coefficient on other-state benefits indicates the presence of strategic interaction, showing that benefit levels elsewhere affect a given state's benefit choice.

Although other explanations exist, the most plausible reason for strategic interaction is a concern about welfare migration. Because in the presence of migration, benefit levels in other states help determine the distribution of the poor, empirical results showing the importance of such benefits provide indirect evidence that welfare migration (real or imagined) is a factor in the choice process.

The regression equation used in testing for strategic interaction is written as follows:

$$T_i = \phi \sum_{j \neq i} \omega_{ij} T_j + Z_i \gamma + \epsilon_i, \quad (7)$$

where  $T_i$  is the benefit level in state  $i$ ,  $T_j$  represents benefit levels in other states  $j$ ,  $j \neq i$ ,  $Z_i$  is a vector of economic and demographic characteristics for state  $i$ ,  $\gamma$  is the associated coefficient vector, and  $\epsilon_i$  is an error term. The  $\omega_{ij}$  terms in Equation 7 are weights that indicate the importance attached by state  $i$  to benefits in the various other states. The simplest weighting scheme is a "contiguity" scheme, which assigns a weight of  $1/n_i$  to each of the  $n_i$  states that shares a border with state  $i$  (yielding  $\omega_{ij} = 1/n_i$  for each such state  $j$ ), while assigning a weight of zero to each noncontiguous state (yielding  $\omega_{ij} = 0$  for each such state).

Under the contiguity scheme, the summation in Equation 7 equals the average welfare benefit in states contiguous to  $i$ . This average is in turn multiplied by the coefficient  $\phi$ . If this coefficient is nonzero, then strategic interaction occurs between a given state and contiguous states. Recalling Equation 6 above, the  $\phi$  parameter represents the slope of the state's reaction function, which can be either positive or negative in the presence of strategic interaction.

An econometric problem in estimating Equation 7 is that the benefit levels on the RHS are endogenous variables. The reason is that benefit levels in all states are jointly determined when strategic interaction occurs. This endogeneity can be addressed either by estimating a reduced-form equation based on Equation 7 or by using an instrumental-variables approach, under which other-state benefits are replaced by fitted values from an auxiliary regression.<sup>14</sup>

Saavedra (1998) estimates this model using the reduced-form approach along with the simple contiguity weighting scheme. She generates results for a sequence of cross sections for the years 1985, 1990, and 1995, consisting of all states in the continental United States. The state characteristics variables include per capita income, the black proportion of the state population, unemployment measures, a variable measuring the power of Democrats in the state legislature, and other variables. Saavedra's results for each year yield a positive and statistically significant estimate of the interaction parameter  $\phi$ . These findings suggest the existence of strategic interaction among the states in the choice of welfare benefits. Moreover, the findings show that reaction functions are upward sloping, with a given state increasing its benefit level as other-state benefits rise.<sup>15</sup>

<sup>14</sup> To get the reduced form, Equation 7 is rewritten in matrix notation as  $T = \phi WT + Z\gamma + \epsilon$ , where  $T$  is the vector of benefit levels,  $W$  is the weight matrix (with representative element  $\omega_{ij}$ ),  $Z$  is the matrix of state characteristics, and  $\epsilon$  is the error vector. Solving for  $T$  yields the reduced-form equation  $T = (I - \phi W)^{-1} Z\gamma + (I - \phi W)^{-1} \epsilon$ , which can be estimated by maximum likelihood methods.

<sup>15</sup> Saavedra's empirical methodology follows Case, Rosen, and Hines (1993), who tested for strategic interaction in the determination of general state expenditures. Their methodology was in turn used by Brueckner (1998) and Brueckner and Saavedra (1997) to test for interaction among local governments.

Figlio, Kolpin, and Reid (1997) estimate Equation 7 using the instrumental-variables approach. They also pool different years of cross-section data, estimating a panel-data version of the model. Given this approach, the model is estimated in first-difference form, with the dependent variable equal to  $T_{i,t} - T_{i,t-1}$ , where  $t$  is the year index (the right-hand variables are transformed similarly).<sup>16</sup> They also replace the simple contiguity weights with a scheme under which the weight  $\omega_{ij}$  that state  $i$  gives to state  $j$  equals the proportion of migrants arriving in state  $i$  who originate in state  $j$  (both poor and nonpoor migrants are counted). The list of state characteristics variables is similar to that used by Saavedra.

The findings of Figlio, Kolpin, and Reid match Saavedra's: The  $\phi$  estimate is positive and significant, indicating that strategic interaction is present and that reaction functions slope up. They also present results for a more complex specification where an increase in other-state benefits has a different effect depending on whether the level is above or below that in the given state. Evidence in favor of this kind of asymmetric response is found.

Smith (1997) alters the specification in Equation 7 by assuming that the benefit choice of a given state is affected by the lagged benefit levels in other states. Thus, the dependent variable in Equation 7 is  $T_{i,t}$ , while the benefit levels on the right-hand side are  $T_{j,t-1}$ , for  $j \neq i$ . Smith uses panel data to estimate the model, and his basic results yield a statistically insignificant estimate of the  $\phi$  parameter. However, when he allows for the kind of asymmetric response explored by Figlio, Kolpin, and Reid, different results emerge. In this case, an increase in other-state benefits has a negative effect when the level is high relative to own-benefits, and it has a zero effect when the level is low. Although these estimates show some evidence of strategic interaction, the results are not as conclusive as those of the other two studies.

Finally, Peterson, Rom, and Scheve (1997) pursue a blend of the above approaches by using the reduced-form method to estimate an intertemporal version of Equation 7 that includes the lagged own-benefit level  $T_{i,t-1}$  along with contemporaneous benefit levels in other states. Although the authors argue that inclusion of the lagged own-benefit corrects for serial correlation of the error term, a proper approach is more complex.<sup>17</sup> Nevertheless, the results match those of Figlio, Kolpin, and Reid (1997) and Saavedra (1998), showing that the reaction-function slope is positive and statistically significant.

Researchers looking for evidence of strategic interaction in the choice of welfare benefits must beware of the possibility of spurious findings. For example, if unmeasured attitudes toward the welfare program vary across regions of the country, then benefits will tend to move together across contiguous states. Benefits will tend to be high in a state located in a generous region and similarly high in neighboring states. Conversely, benefits will tend to be low in a state in a less generous region and low in its neighbors. This tendency may give a false impression of strategic interaction when it simply reflects failure to control for attitudes toward income redistribution. The procedures of Figlio, Kolpin, and Reid (1997) and Saavedra (1998) are designed to eliminate the possibility of such spurious findings.

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<sup>16</sup> Instead of using AFDC benefits as the dependent variable, as does Saavedra (1998), Figlio, Kolpin, and Reid (1997) use benefits plus the value of food stamps for a family of three.

<sup>17</sup> In a standard regression model, an approximate correction for serial correlation can be achieved by first differencing all the variables. This is equivalent to setting the coefficient on the lagged own-benefit equal to one and to first differencing the remaining variables. The failure to carry out such a transformation of the other variables casts doubt on Peterson, Rom, and Scheve's (1997) procedures.

*Related Studies*

Several other papers provide less direct tests for strategic interaction. As noted above, Smith (1991) analyzes a theoretical model with strategic determination of welfare benefits. She shows that the equilibrium level of benefits in a state depends not only on its own characteristics, but also on the characteristics of neighboring states. This dependence, which emerges in any model with strategic interaction, can be tested by including other-state characteristics in a reduced-form regression explaining welfare benefits. Smith's results show that an increase in the poor population in contiguous states has the same negative effect on the benefit level as an increase in the number of local poor. Although this reduced-form result is not a direct test for strategic interaction, it is consistent with this phenomenon.

Wheaton (1997) also carries out empirical tests that are closely linked to a theoretical model of strategic interaction. His model, which uses the multinomial-logit migration setup described in section 2, generates a number of comparative-static predictions. For example, the model predicts that states with high incomes and large populations choose high benefit levels and attract large numbers of recipients. Wheaton estimates cross-section regressions using 1994 data to test whether these predictions are upheld. He finds that benefit levels and recipient populations both vary with state characteristics in a way that closely matches the model's predictions. This finding provides evidence in favor of his model of strategic interaction.

Shroder (1995) estimates a simultaneous-equation model in which a state's welfare benefit depends on the number of recipients, with recipients in turn depending on the local benefit level as well as benefits in nearby states. This setup is similar to that of Gramlich and Laren (1984), but Shroder emphasizes the implications of his results for strategic interaction rather than welfare migration. Although the theory predicts that the number of local welfare recipients should fall as other-state benefit levels rise, Shroder's findings show mixed results for this variable. Based on this finding, he argues against the strategic-interaction approach.<sup>18</sup>

*Implications*

On balance, the evidence reviewed above appears consistent with the view that strategic interaction occurs among the states in the choice of welfare benefits. The studies of Figlio, Kolpin, and Reid (1997) and Saavedra (1998) provide strong evidence that a given state's benefit choice is affected by benefit levels in nearby states, and this finding is reinforced by the less direct evidence provided by Smith (1991) and Wheaton (1997).

**5. Conclusion**

Economists have argued that welfare migration leads to a race to the bottom in the choice of welfare benefits. To avoid becoming a welfare magnet, each state chooses a benefit level that is too low from society's point of view. A system of federal matching grants can remedy this problem, stimulating state spending so that benefit levels rise toward socially desirable levels. Welfare reform, however, replaced the existing matching-grant system with block grants. If a

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<sup>18</sup> A potential problem with Shroder's (1995) methodology is that, unlike in the studies discussed above, other-state benefits are not treated as endogenous. It should be noted that own-state benefits have the expected positive effect on the number of recipients.

race to the bottom exists, so that matching grants are needed to provide the proper stimulus to spending, then a key feature of the recent welfare reform law may be undesirable.

The goal of this paper has been to judge whether this critique of welfare reform is justified by evaluating the evidence in favor of a race to the bottom. After showing theoretically that welfare migration depresses benefit levels, requiring corrective matching grants, the paper surveys the empirical evidence on such migration, concluding that the evidence is mixed. I argue, however, that state limitations on welfare benefits for new migrants show that policymakers act as if welfare migration is a significant phenomenon. This conclusion is reinforced by the paper's survey of recent empirical tests for strategic interaction, which show that benefit levels in nearby states affect a given state's benefit choice. The most plausible source of such strategic interaction is a concern about welfare migration, which leads policymakers to look at benefits in neighboring states in making their own choices.

Although evidence on welfare migration is mixed, the direct behavioral evidence of strategic interaction is compelling. It suggests that states are indeed playing a welfare game, which is most likely motivated by a concern about welfare migration, and that a race to the bottom may emerge. This conclusion suggests that the matching-grant system under the old welfare regime served a useful purpose, namely counteracting a tendency on the part of states to underspend on welfare, and that its demise may be undesirable from a policy perspective.

This critique of welfare reform, which comes from merging a theoretical model with some disparate pieces of evidence, is mainly conceptual in nature, as noted in the introduction. While the conceptual point may be noteworthy by itself, it is important to evaluate its practical significance. The question is whether, given the current state of knowledge, this critique should be taken seriously or whether it should be viewed as a potentially useful point that deserves further study.

A number of possible qualifications are relevant in deciding this issue. First, as noted in the introduction, greater flexibility in the use of federal funds under the block-grant system may actually stimulate state contributions as new, more productive types of expenditures are discovered via state innovation. Second, as noted above, the theory indicates a qualitative need for matching grants but does not reveal the proper quantitative magnitudes of the matching rates, which cannot be computed reliably using existing information. On the one hand, it could be argued that even when welfare migration is significant, the additional cost it generates is so small relative to the burden of the existing caseload that matching rates should be very low (well below the 50% minimum under the old regime). If the proper matching rates are negligible, then the block-grant system looks more palatable, undercutting the above critique. If correct, this argument in fact provides an indictment of the previous regime by suggesting that AFDC matching rates were much too high. A counterargument, however, would claim that states overreact to the threat of welfare migration, so high that corrective matching rates are required. Unfortunately, resolution of this issue does not appear possible using the existing evidence.

A third qualification is that although the theory is based on a model of rational public choice at the state level, empirical evidence does not uniformly support such a perspective. A persistent empirical finding that casts doubt on the model is the flypaper effect, under which block grants stimulate spending more than equivalent increases in own income (Courant, Gramlich, and Rubinfeld 1979). This outcome, which contradicts the model, suggests that it may be dangerous to predict the effect of switching to block grants using the standard theory.

A fourth qualification is that the critique may suffer from misplaced emphasis. In particular, it might be argued that the most significant impacts of welfare reform on aid to the poor will

follow from other effects. For example, the impact of lower benefits per recipient may be dwarfed by the law's restriction on eligibility, a consequence of its duration limits and work requirements. The critique also overlooks an additional drawback to the block-grant system, namely its insensitivity to the business cycle. While federal contributions rise under matching grants as benefits become more generous—a stimulative effect that lies at the heart of the critique—federal contributions also rise as the number of recipients increases, holding the benefit level constant. Therefore, the matching-grant system allows federal contributions to respond to a recession-induced increase in the “demand” for welfare at the state level, as reflected in rising caseloads. By contrast, because block grants under the new system are inflexible over the business cycle, federal contributions are insensitive to changes in state needs. This insensitivity, however, is not a necessary feature of a block-grant system, as grant levels could be raised during a recession. It is conceivable that Congress will undertake such adjustments during the next business downturn.<sup>19</sup>

A final point related to the business cycle, noted in the introduction, is that the current economic boom has cut the demand for welfare to such an extent that states are not spending all of their federal block-grant money. While this suggests that the form of the grant system may be of little relevance in boom times, the argument I developed is likely to become germane again in the next economic downturn.

The above qualifications suggest that this paper's critique of the new block-grant system should be viewed as tentative. Although the theory points to a need for matching grants to counteract a race to the bottom, and although the existing evidence partly supports this prescription, the quantitative importance of the race to the bottom is still an open question. In addition, the impact of other elements of the new law may be more far-reaching than the effect identified in the critique. However, because welfare reform is an important policy initiative, further study of the issues underlying the present critique is needed.

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<sup>19</sup> See Dye and McGuire (1998) for further discussion of these issues.

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