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E C O N O M I C S B U L L E T I N

Are Welfare Eligible Households Forward Looking?

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Abstract

A consensus has formed in the welfare reform literature suggesting that welfare eligible households (WEH) "bank" benefits in the presence of time limits, either by delaying enrollment in welfare or exiting well before the time limit is reached. In this study, we use the standard labor-leisure lifetime utility to analyze the behavioral effects of imposing time limits on welfare use. Our approach is different from our predecessors (which model welfare participation) in that we model delayed enrollment in and early exit from welfare. Our results suggest that prior to time limits, WEH enroll in welfare as soon as eligibility is established and remain on assistance programs until their youngest children reach adulthood. Moreover, time limits do not alter this behavior in WEH with older children. As such, being "forward looking" in an era of time limits is not a sufficient condition for banking welfare benefits.

An early version of this paper was presented at the 2006 annual meeting of the Western Economic Association International, July 1, San Diego, CA. The authors are grateful for the helpful comments from Jeffrey A. Edwards, Mark L. Burkey, Lorien Rice, Dan Friesner and several participants at the 2006 WEAI meetings. All remaining errors are our own.
Citation: Snarr, Hal and Dan Axelsen, (2008) "Are Welfare Eligible Households Forward Looking?." *Economics Bulletin,* Vol. 9, No. 8 pp. 1-9
Submitted: March 28, 2008. **Accepted:** April 11, 2008.
URL: http://economicsbulletin.vanderbilt.edu/2008/volume9/EB-08I30020A.pdf

1. Introduction

In 1996, the Personal Responsibility and Work Reconciliation Act (PRWORA) of 1996 marked a dramatic change in welfare policy. Its predecessor, Aid for Families with Dependent Children (AFDC), was consistently criticized for perpetuating welfare dependence and discouraging employment among welfare recipients. Thus, a primary goal of PRWORA is to replace AFDC with a program that emphasizes immediate labor force participation and long-term self-sufficiency for welfare eligible households (WEH). A crucial component of PRWORA's new program (Temporary Assistance for Needy Families, or TANF) is the imposition of a time limit on the number of months an individual can receive benefits. In most cases, this limit is 60 months.

The imposition of time limits essentially changed how WEH perceive benefits. Under AFDC, welfare benefits represented a flow of income. However, time limits imposed by TANF changed this flow into a stock of wealth. Like any other stock of wealth, it is reasonable to posit that WEH "bank" welfare benefits, strategically using those benefits (by moving on and off the welfare rolls) when they are needed the most. For example, single mothers with school-age children and without adequate child care may find employment during the school-year, but go on welfare during the summer months.

Several studies have postulated that forward looking WEH delay enrolling in and exit early from the TANF program to avoid using up time-limited benefits (Grogger and Michalopoulos 1999 and 2003; Kaushal and Kaestner 2001; Grogger 2003, 2004a and 2004b; and Swann 2005). If one approaches econometric data with this "forward-looking conjecture" in mind, one can certainly interpret some econometric results as being supportive of this notion. For example, Grogger (2003) reports that families with young children use welfare by 6.6 percentage points less than those with children older than 13, citing this as evidence of benefit banking. However, this interpretation makes the implicit assumption that welfare reform affected single mothers with young (non-school age) children in the same way as those with older children. Clearly, this assumption may or may not be the case, depending on the availability of adequate child care for young children during the school year.

This assumption brings up an important issue: does the forward-looking hypothesis apply to all welfare eligible households? It may be the case that individuals or households, especially those facing family constraints, health concerns (which increases the utility of having health insurance) or other factors may rationally decide not to bank benefits, or to bank welfare benefits in a manner that is either inconsistent with, or not specifically due to, the forward-looking hypothesis. The purpose of this note is to demonstrate that the forward-looking hypothesis is not a sufficient condition for welfare benefit banking. Instead, more general considerations, which create what we term as a "utility gap" may be driving these decisions.

Our results also provide some additional insight into the forward-looking conjecture. In the absence of time limits, WEH enroll in welfare as soon as eligibility is established and then remain on until their youngest children reach adulthood. In addition, we find that the imposition the 5-year time limit does not alter this behavior in WEH with children older than 13. Instead, there are several factors (e.g., real wage growth, economic expansion, the EITC, childcare subsidies, transitional health insurance, and temporary payroll tax waivers) that trigger delays and early exiting.

2. The Model

Following Fang and Silverman (2004), we cast our model in the context of a theoretical experiment that contributes to the literature in several unique ways. First, we recognize inertia in welfare and employment spells, and model benefit banking via delay (time K) and early exiting (time T). Second, we allow preferences, reactions to economic conditions and policy to vary across welfare eligible households (WEH). Finally, unlike Fang and Silverman, but like Grogger and Michalopoulos (1999), we allow the welfare eligible to work and receive welfare benefits simultaneously.

Our model is centered around a "typical" household that is eligible for welfare from period zero to E, enrolls in welfare at time K, and then exits at time T ($E \geq T > K \geq 0$). Current period choices include consumption (c), leisure (l), and welfare participation (P), which is assumed to mean enrollment in a program similar to TANF or AFDC. Following the structure outlined in Hu (1978), lifetime utility is given by

$$U = \int_0^E e^{-\rho t} \cdot u(t) dt \,. \tag{1}$$

Instantaneous utility is assumed to be

$$u(t) = \theta \cdot \ln c(t) + \lambda(\mathbf{x}, t \mid P) \cdot \ln l(t) + \alpha \cdot S(t) + \mu \cdot B - \delta \cdot P \,, \tag{2}$$

where B denotes receipt of government in-kind benefits, S represents the stock of benefits remaining, and δ and μ represent welfare stigma and marginal utility of B. λ is a function of employment tenure and demographics ($\mathbf{x}$). For some, λ declines faster over work spells than over welfare spells because self-reliance increases faster when not on welfare. The use of the utility shifters B, P and S were inspired by Moffit's (1981) welfare stigma model.

All income earned by the household is spent in the period it is earned/awarded (Stegman and Faris 2001, Edin and Lein 1997). However, under TANF, benefit banking is a possible form of saving. With m denoting the time limit, S is

$$S(t \mid E) = \begin{cases} E - t & \forall t \in [0, E] \\ 0 & \forall t \in (E, \infty) \end{cases} \tag{3a}$$

and

$$S(t, K, T \mid m) = \begin{cases} m & \forall t \in [0, K] \\ m - (t - K) & \forall t \in (K, T] \\ m - (T - K) & \forall t \in (T, \infty) \end{cases} \tag{3b}$$

The corresponding equations of motion are

$$\dot{S}(t \mid E) = \begin{cases} -1 & \forall t \in [0, E] \\ 0 & \forall t \in (E, \infty) \end{cases} \tag{4a}$$

and
$$\dot{S}(t,K,T \mid m)=\begin{cases} 0 & \forall t \in [0,K] \\ -1 & \forall t \in (K,T] \\ 0 & \forall t \in (T,\infty) \end{cases} \tag{4b}$$

Income includes the cash grant (G) if on welfare, earnings (wh), and other income outside of work (O) (e.g., food stamps and childcare subsidies). We assume w is stochastic and unknown until t. The budget constraint is given by

$$c(h_P)=(1+\tau_P)wh_P+GP+O-D_P, \tag{5}$$

where τ_P and D_P are the net tax on labor earnings and out-of-pocket daycare expenses, respectively, and τ_1 is at least as much as τ_0 to encourage work.

The household is faced with both time and budget constraints. The household's total allotment of time (H) can be expressed as the sum of time spent working (h_P) and consuming leisure (l_P) in period t given decision P.

In totem, the household's problem can be re-expressed as follows:

$$\mathcal{L}_i(\mathbf{h},K,T)=\Omega(\mathbf{h},K,T)+\Phi_i(K,T) \tag{6}$$

where i is equal to one if the household is constrained by time limit m, and zero otherwise;

$$\begin{aligned}\Omega(\mathbf{h},K,T)=&\int_0^K e^{-\rho t}\left[\theta \ln c(h_0)+\lambda(t \mid 0)\cdot \ln(H-h_0)+\mu B_0\right]dt \\ &+\int_K^T e^{-\rho t}\left[\theta \ln c(h_1)+\lambda(t \mid 1)\cdot \ln(H-h_1)+\mu B_1-\delta\right]dt \\ &+\int_T^E e^{-\rho t}\left[\theta \ln c(h_0)+\lambda(t \mid 0)\cdot \ln(H-h_0)+\mu B_0\right]dt;\end{aligned} \tag{7}$$

$$\begin{aligned}\Phi_1(K,T)\equiv&\alpha\int_0^K me^{-\rho t}dt+\alpha\int_K^T (m-t+K)e^{-\rho t}dt \\ &+\alpha\int_T^E (m-T+K)e^{-\rho t}dt+(m-T+K)\gamma;\end{aligned} \tag{8a}$$

$$\Phi_0(T)\equiv\alpha\int_0^E (E-t)e^{-\rho t}dt+(E-T)\varphi. \tag{8b}$$

Lagrange multipliers, φ and γ, represent the utility gained from the receipt of a one period extension of E and m, respectively.

As mentioned earlier, we conduct a theoretical experiment to test the effects of imposing time limits on behavior. In order to do so, we impose the following conditions:

C1 $B_0 = 0$ and $B_1 = 1$;

C2 $\delta < \mu$;

C3 w is known in the present (K), while $\bar{w}$ is the expected wage in the future (T).

Condition C1 allows us to isolate the impact of the time limit so that we do not overly complicate the analysis by bundling in other reforms which include, but certainly are not limited to work

requirements, sanctions and work trigger limits. C2 says welfare stigma is trumped by the piece of mind of having health insurance. According to C3, *forward-looking* households decide how many benefits to bank ($T - K$) today in period K based in part on past and present wages and expectations of future wages in period T and beyond.

Our solution uses a two-step procedure. In the first step we derive labor supply on and off welfare, while in step two household choices reduce to K and T. The first part of our solution, assuming an interior solution, yields

$$h_P^* = \frac{\theta(1+\tau_P)Hw - (GP + O - D_P)\lambda}{(\theta+\lambda)(1+\tau_P)w}. \tag{9}$$

Substituting (9) into (7) reduces the household's decisions to K and T. The resulting indirect lifetime utility function given policy regime i is

$$V_i(K,T) = \Omega(\mathbf{h}^*, K, T) + \Phi_i(K,T). \tag{10}$$

Differentiating (10) with respect to K and T, and the multipliers yield

$$\frac{\partial V_i}{\partial K} = -\Delta v \cdot e^{-\rho K^*} + \left[\alpha \cdot \rho^{-1} \cdot e^{-\rho K^*} + \gamma^*\right] \cdot i \le 0, \quad K^* \ge 0, \quad \frac{\partial V_i}{\partial K} \cdot K^* = 0; \tag{11a}$$

$$\frac{\partial V_i}{\partial T} = \Delta\overline{v} \cdot e^{-\rho T^*} - \varphi^* \cdot (1-i) - \left[\alpha \cdot \rho^{-1} \cdot e^{-\rho T^*} + \gamma^*\right] \cdot i = 0; \tag{11b}$$

$$\frac{\partial V_1}{\partial \gamma} = m - T^* + K^* \ge 0, \quad \gamma^* \ge 0, \quad (m - T^* + K^*) \cdot \gamma^* = 0; \tag{11c}$$

$$\frac{\partial V_0}{\partial \varphi} = E - T^* \ge 0, \quad \varphi^* \ge 0, \quad (E - T^*) \cdot \varphi^* = 0; \tag{11d}$$

where $v_P(w) \equiv \theta \ln c_P^*(w) + \lambda(\mathbf{x}, t \mid P) \cdot \ln l_P^*(w) + \mu B - \delta P$, $\Delta v \equiv v_1(w) - v_0(w)$, and $\Delta\overline{v}$ denotes Δv evaluated at $\overline{w}$. Conditions (11a) and (11b) apply to both policy regimes, (11c) applies to regime $i = 1$, while (11d) applies to the other.

3. The Behavioral Effects of Time Limits

Having developed our model, we are now in a position to discuss some of the behavioral effects of imposing time limits on welfare eligible households. The following propositions and corollaries provide these insights. Please refer to the Appendix of the paper for all proofs.

PROPOSITION 1. Without time limits households enroll in welfare immediately and remain on welfare indefinitely.

COROLLARY 1 OF PROPOSITION 1. Households facing time limit m with children older than $E - m$ enroll in welfare immediately and remain on until time E.

PROPOSITION 2. Forward looking households with young children facing time limit m bank benefits if time-limit extensions are highly valued.

With some algebraic manipulation, the proof of this proposition implies that

$$\Delta v \geq \Delta \bar{v} e^{-\rho m} + \int_0^m \alpha e^{-\rho t} dt .$$

This result, which is equivalent to (1) in Grogger and Michalopoulos (1999, pp. 8), suggests that benefits are utilized in the present if the current-period "utility gap" - that is, the difference between current period utility on welfare compared to current utility off welfare - exceeds the expected loss in future utility. However, this result (a) only applies to households with children younger than $E - m$, and (b) is based on holding all but w constant over time, and across individuals with the same discount rate. The following corollaries of PROPOSITION 2 illustrate the importance of other factors.

COROLLARY 1 OF PROPOSITION 2. If the future expected utility gap falls, forward looking households do not bank benefits.

COROLLARY 2 OF PROPOSITION 2. If the future expected utility gap rises relative to the current period gap, myopic households bank benefits.

Taken in tandem, our propositions imply several key themes for the welfare literature. First, and most importantly, we show that time limits affect different sectors within the welfare eligible population differently. Some households bank benefits, some enroll immediately and remain on welfare until all benefits are exhausted and (in extreme cases where the utility gap is zero) never go on welfare.

Second, we show that the determining factor in welfare banking decisions is the utility gap, which represents the difference between current period utility on welfare and current utility off welfare. Consistent with the existing literature, the utility gap will depend upon household discount rates and expected future wage rates. However, it will also depend on *other* factors as well, including the age of children and the availability (and costs) of child care. Depending on the characteristics of the household, those other factors may be the crucial determinants of welfare banking decisions, and ultimately the success or failure of welfare programs such as TANF. Thus, the existing forward-looking hypothesis is not a sufficient condition (and in extreme cases, may not even be a necessary condition) for benefit banking to occur.

Third, our model, while admittedly simplistic, implies that a re-examination of the empirical welfare literature is necessary. While empirical results themselves do not "lie", the interpretation of those results are predicated upon theoretical models which we have shown *may* be inconsistent with actual decisions made by WEH. Thus, it is important to re-examine those empirical results (and their implications for policy) to determine whether they are appropriate in light of our findings.

4. Conclusion

There is a vast literature on time limits, most of which focuses on whether welfare recipients respond to the time limit by delaying enrollment in or exiting early from welfare to save benefits for the future. From our model it is clear that this is one plausible explanation, but that more importantly, such a decision ultimately depends upon the utility gap which is affected by a multitude of factors. We believe that future empirical and theoretical work in this area should model the benefit banking decision as we have as well as incorporate, in a more comprehensive manner, other factors which explain the utility gap. Once modeled in the way that we have described herein, the forward-looking conjecture can be more appropriately tested empirically and the magnitude of such an effect can more precisely be relied upon. However, no test should be conducted without also testing the effects of the other various factors that influence the utility gap. These tests should be conducted within the same framework so that relative comparisons can be made, and policy effects from welfare reform can more precisely and correctly be understood.

It is also important to note that our model, while interesting, is extremely simple. As such, it should be interpreted merely as a counter-example. We have not shown that the forward-looking hypothesis is unequivocally wrong. Instead, we have shown that it *might* be wrong, especially if other factors other than those used in the forward-looking models are important to welfare eligible households. We have also shown in our model how those factors distort decisions made under the forward-looking hypothesis. However, future work is necessary to fully model welfare-to-work decisions in the presence of time limits to fully understand whether or not the forward-looking hypothesis is exhaustive and reliable.

Appendix

PROOF OF PROPOSITION 1. With $i = 1$ (11a) reduces to

$$\Delta v \geq 0, \quad K^* \geq 0, \quad \Delta v \cdot K^* = 0$$

Given C.1, the utility gap reduces to

$$\theta \ln\left(\frac{c_1^*}{c_0^*}\right) + \lambda \ln\left(\frac{l_1^*}{l_0^*}\right) + \mu - \delta,$$

which is positive if $c_1^* \geq c_0^*$, $h_0^* \geq h_1^*$, and $\mu > \delta$. The latter is true by C.2. Suppose $c_1^* < c_0^*$. If $\tau_1 = \tau_0$, $c_1^* < c_0^*$ simplifies to

$$G < -(D_0 - D_1) < 0,$$

a contradiction because $D_0 > D_1$. If $\tau_1 > \tau_0$, then $c_1^* < c_0^*$ becomes

$$w < -\frac{G + D_0 - D_1}{(\tau_1 - \tau_0)H} < 0,$$

also a contradiction. Thus, $c_1^* \geq c_0^*$. Now suppose $h_0^* < h_1^*$, which can be written as

$$\left[\theta(1+\tau_0)Hw-(O-D_0)\lambda\right](1+\tau_1)<\left[\theta(1+\tau_1)Hw-(G+O-D_1)\lambda\right](1+\tau_0),$$

$$(1+\tau_1)(O-D_0)>(1+\tau_0)(G+O-D_1)>(1+\tau_0)(G+O-D_0),$$

or
$$G<\frac{\tau_1-\tau_0}{1+\tau_0}(O-D_0). \tag{12}$$

Let $G \propto (O - D_0)$ by some factor say ε. If either $O < D_0$ or ε is at least as much as the *tiny* difference between τ_1 and τ_0, then (12) represents a contradiction. Hence, $h_0^* \geq h_1^*$, and so Δv is positive. This means $K^* = 0$ by (11a). Since the future utility gap is positive for the same reasons as the current utility gap, we have $\varphi^* > 0$ by (11b). Together, this and (11d) imply $E = T^*$. *QED.*

PROOF OF COROLLARY 1 OF PROPOSITION 1: Let A denote age of youngest child. Households with children older than $E - m$ have only $E - A$ time left on provided E is not extended (e.g., via childbearing). The rest of the proof follows from PROPOSITION 1. *QED.*

PROOF OF PROPOSITION 2. If the household values time limit extensions and children are younger than $E - m$, $K^* = T^* - m$ by (11c). Collapsing (11a), (11b) and (11c) yields

$$(\Delta v-\alpha/\rho-(\Delta\overline{v}-\alpha/\rho)e^{-\rho m})\cdot(T^*-m)=0$$

According to (11a), $T^* = m$ if

$$\Delta v-\alpha/\rho>(\Delta\overline{v}-\alpha/\rho)e^{-\rho m}, \tag{13}$$

Also, $K^* = 0$ when $T^* = m$. But if $T^* > m$, then by (11a) we must have

$$\Delta v-\alpha/\rho=(\Delta\overline{v}-\alpha/\rho)e^{-\rho m}. \tag{14}$$

Also, $K^* = m - T^* > 0$ when $T^* > m$. Let ρ_1 be such that

$$(\rho_1\Delta v-\alpha)e^{\rho_1 m}-\rho_1\Delta\overline{v}+\alpha=0. \tag{15}$$

Holding all else equal, let ρ_0 be such that $\rho_0 > \rho_1$. Then

$$\rho_0\Delta v e^{\rho_0 m}-\rho_1\Delta v e^{\rho_1 m}>0 \qquad \text{and} \qquad \rho_0\Delta\overline{v}-\rho_1\Delta\overline{v}>0.$$

If
$$\rho_0\Delta\overline{v}-\rho_1\Delta\overline{v}>\rho_0\Delta v-\rho_1\Delta v>0,$$

there exists $\varepsilon > 0$ such that

$$\rho_0\Delta v - \rho_1\Delta v + \varepsilon = \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v}\,.$$

Since $\rho_1 m > 0$,

$$(\rho_0\Delta v - \rho_1\Delta v + \varepsilon)e^{\rho_1 m} \gg \rho_0\Delta v - \rho_1\Delta v + \varepsilon = \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v}\,.$$

But does this suggest that the following holds?

$$(\rho_0\Delta v - \rho_1\Delta v)e^{\rho_1 m} > \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v}\,. \tag{16}$$

Adding $\varepsilon e^{\rho_1 m}$ to both sides of this yields the mathematically equivalent statement

$$(\rho_0\Delta v - \rho_1\Delta v)e^{\rho_1 m} + \varepsilon e^{\rho_1 m} > \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v} + \varepsilon e^{\rho_1 m} > \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v} \tag{17}$$

Suppose (16) does not hold, and so (17) wouldn't either:

$$(\rho_0\Delta v - \rho_1\Delta v + \varepsilon)e^{\rho_1 m} \le \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v} + \varepsilon e^{\rho_1 m} \le \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v}\,,$$

This suggests $\varepsilon \le 0$, a contradiction, and so (16) holds. (16) is equivalent to

$$(\rho_0\Delta v - \alpha - \rho_1\Delta v + \alpha)e^{\rho_1 m} > \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v} > 0\,,$$
$$(\rho_0\Delta v - \alpha)e^{\rho_1 m} - (\rho_1\Delta v - \alpha)e^{\rho_1 m} > \rho_0\Delta\overline{v} - \rho_1\Delta\overline{v} > 0\,,$$
$$(\rho_0\Delta v - \alpha)e^{\rho_0 m} - (\rho_1\Delta v - \alpha)e^{\rho_1 m} > (\rho_0\Delta v - \alpha)e^{\rho_1 m} - (\rho_1\Delta v - \alpha)e^{\rho_1 m}\,,$$

or $$(\rho_0\Delta v - \alpha)e^{\rho_0 m} - \rho_0\Delta\overline{v} + \alpha > (\rho_1\Delta v - \alpha)e^{\rho_1 m} - \rho_1\Delta\overline{v} + \alpha\,.$$

The right hand side of this is equal to zero by (15). Hence, $K^* = 0$ and $T^* = m$ with ρ_0, but with ρ_1, $K^* > 0$ and $T^* > m$. *QED.*

PROOF OF COROLLARY 1 OF PROPOSITION 2. A and B are identical with the exception of expectations of future events. Suppose A's expectations of the future are given in (15) by $\Delta\overline{v}$. Let B's future expectations be different from A's because B believes that the government at some point will offer in-kind benefits to those not on welfare ($B_0 = 1$):

$$\Delta\overline{v}_B \equiv \theta\ln\left(\frac{c_1^*(\overline{w})}{c_0^*(\overline{w})}\right) + \lambda\ln\left(\frac{l_1^*(\overline{w})}{l_0^*(\overline{w})}\right) - \delta\,,$$

which implies $$\Delta\overline{v} > \Delta\overline{v}_B\,,$$

$$-\rho_1\Delta\overline{v}_B > -\rho_1\Delta\overline{v}\,,$$

$$(\rho_1\Delta v - \alpha)e^{\rho_1 m} - \rho_1\Delta\overline{v}_B + \alpha > (\rho_1\Delta v - \alpha)e^{\rho_1 m} - \rho_1\Delta\overline{v} + \alpha = 0\,.$$

Thus, even though both are equally forward looking, A delays but B does not. *QED.*

PROOF OF COROLLARY 2 OF PROPOSITION 2. The proof of this follows directly from the proof of PROPOSITION 2.

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