**The welfare wall, reservation wages,
and labour force attachment**

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Abstract

Most studies on the "welfare wall" discuss work disincentive effects under the "rational decision-maker" model, where individuals make a decision to work based on net wage rates, the value placed on leisure activities, family responsibilities, etc. This paper examines the concept of the welfare wall and its expression in the form of an effective marginal tax rate that discourages work. Although this approach has conceptual appeal, it is empirically intractable. An alternative empirical approach, resting on the conceptual foundation of a reservation wage and empirically tested using discrete choice methodology, proves a viable alternative measurement strategy. This paper presents estimates of the welfare wall as a function of recipient attributes. A robust sample of low income recipients of the National Child Benefit Supplement (Canada) supports the empirical analysis of this concept. One important finding is that the financial and non-financial benefits associated with social welfare systems push the welfare wall (reservation wage) above the minimum wage. This effectively limits the labour force participation of many people on social assistance.

Introduction

Most studies on the welfare wall discuss work disincentive effects under the "rational decision-maker" model, where individuals decide between work and non-work (leisure) based on a range of factors such as wage rate, the value placed on leisure activities, and family responsibilities. Abstracting non-monetary rewards from working, the financial benefit of work is, of course, a function of net income. For a social assistance (SA) recipient,[1] net income is the wage less taxes and less the monetary value of non-financial benefits lost as earnings become an increasing proportion of total income.

In general, the *marginal tax rate* (MTR) is the change in taxation deductions induced by a one-dollar increase in earnings. For an individual receiving income support, the effective MTR tracks the loss of benefits, both financial and non–financial, as earnings increase. The rational decision-maker decides to work more or accept a higher paying job based in part on the change in net (after tax) income or the MTR on the extra income.[2] The welfare wall represents the wage needed for welfare recipients to leave SA and accept work. It increases as the generosity of SA programs increases, since recipients have more to lose by accepting a job.

The direct way to estimate the welfare wall is to measure the effective marginal tax rate (EMTR) by examining the withdrawal (taxing back) of benefits as SA recipients increase their earnings. However, this estimation is complex. SA programs offer an array of in-kind benefits and financial assistance packages for clothing, medical services, housing, transit, etc. In federal states, such as Canada, provinces and municipalities can offer a variety of programming directed to low income residents. The calculation of the welfare wall using EMTRs becomes a complex and painstaking task that must account for family size and composition as well as program permutations.

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[1]   The terms "social assistance recipient," "income assistance recipient," and "welfare recipient" are synonymous.

[2]   In this paper, the economically rational decision-maker is the standard. However, some who would qualify for income assistance may prefer to work, even if their incomes are lower as a result. Further, it is important to acknowledge that some who would qualify for income support fail to apply because of ignorance or oversight.

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This paper begins with a brief review of the welfare wall and the concept of a reservation wage expressed through the concept of willingness to pay, and then presents an empirical analysis based on a large sample survey (n=5285) of recipients of the National Child Benefit Supplement (NCBS) in Canada.

The welfare wall

Measurement of the welfare wall is an important policy challenge. Setting earnings disregards and other features of the social safety net will determine the willingness of social assistance (welfare) recipients to seek paid work.[3] That, in turn, directly affects the costs of these programs and possibly indirectly influences the perceptions and expectations of children in households receiving this income support.

Formally, the EMTR is the financial value of the cash and in-kind benefits that SA recipients must give up if they accept work.[4] The EMTR is the absolute value of the change in disposable income for a $1 increase in earnings. Here, disposable income includes the increase in earnings less the reduction of cash benefits, less the monetary value of non-cash benefits, less the costs of going to work, such as child care. If the reduction in disposable income exceeds the increase in earnings, the EMTR exceeds 100%.[5]

Recent welfare reforms in Canada and the United States have attempted to deal with this by restructuring earnings disregards and earnings supplements. In Canada, the government has tried to structure the Canada Child Tax Benefit (CCTB) and provincial programming to blunt this benefit reduction as earnings rise.[6] One element of the CCTB, the National Child Benefit (NCB), focuses on families with less that $32,000 in annual income. This add-on supplements the cash benefits under the CCTB and involves the provinces in offering a range of supporting programs to reduce child poverty and increase work incentives.

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[3]   An earnings disregard is a direct method for reducing the welfare wall, by allowing SA recipients to retain a portion of their earnings without reduction in financial and non-financial support.

[4]   A basis for the welfare wall is the MTR on earnings of SA recipients. For earnings, this is given by the expression MTR = 100% $[1 - \Delta Yd/\Delta E]$, where Yd = total disposable income, and E = earnings from employment. An increase in earnings of $100, resulting in a change in disposable income of $20, implies an 80% MTR. For an income assistance client, $Yd = SA + E$, and $\Delta Yd = \Delta SA + \Delta E$. This implies that MTR = 100% $[1 - \Delta Yd/\Delta E]$ = 100% $[1 - (\Delta E/\Delta SA)]$ and MTR = 100% $[\Delta SA/\Delta E]$.

[5]   The EMTR need not exceed 100% to create a disincentive to work. Some parents would strongly prefer to parent their children and may refuse to accept jobs when the EMTR is less than 100% and working would still result in a net increase in disposable income.

[6]   Briefly, the CCTB is an income support offered to families that is conditioned on net income and number of children under 18. It consists of a core program, the Child Tax Benefit, which extends support on a sliding scale to families with annual incomes of over $100,000. A supplementary case benefit, the NCBS, provides a case benefit for families with incomes of less than $32,000.

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With welfare reform initiatives, aside from earnings disregards, many jurisdictions offer transitional health programs that allow SA clients to retain medical and pharmaceutical coverage for some time after starting employment. Another approach is to declare social assistance recipients as ineligible for the NCBS. This most controversial provision of the NCBS[7] allows provinces to deduct the NCBS from families receiving income assistance.[8] The intent of this provision was to focus the NCBS on the working poor as an incentive to continue to work. The family receiving SA receives the same monthly level of support before and after the NCBS; however the action of sending an NCBS cheque and reducing the income assistance payment had extremely poor political optics.

Despite these changes, many people on SA, especially those with children, still find that their total income falls as they accept employment.

In most jurisdictions, SA recipients retain benefits over initial increases in earnings, but at some level of earnings, they lose access to services, such as subsidized housing, medical benefits, etc. If the increased earnings are insufficient to cover the losses of in-kind benefits or subsidies, as well as the loss of cash benefits, the effective MTR will exceed 100%. According to the rational decision-maker model, no one would agree to work in this situation.

Conceptual measurement of the welfare wall

The welfare wall may be viewed conceptually in many perspectives, three of which include the following.

- *The ratio of EMTRs* for those on SA compared to those who work shows the differential rate at which extra earnings translate into disposable income. Earnings translate more rapidly for those who work. Earnings disregards and earnings supplements directly affect this ratio.

- *The gap in disposable income* is the difference in total disposable income available to SA recipients compared to those who work. The gap can be measured as a specific level of earnings or as an area reflecting the advantage of SA over all earnings. In Figure 1, the gap appears as the difference in total disposable income available to those on SA compared to those who work.

- *The height of the welfare wall* is the gross earnings needed to leave SA or the level of gross earnings where disposable income from earnings equals the disposable income from SA. Depending on the configuration of various in-kind benefits and other income-tested programs, this value will vary among jurisdictions.

Figure 1 presents the situation graphically. The slope of AC relative to BC represents the ratio of EMTRs for SA clients versus earners; the gap FE shows the welfare wall at wage rate G; and BD is the height of the welfare wall or the wage needed to compensate for the loss of all SA benefits. Measuring BD is the subject of this paper.

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[7]   The entire NCB program consists of a cash supplement and a set of financial and non-financial benefits offered by the provincial governments. The federal government provides a basic income supplement by the net income and family size. Some provinces offered cash benefits similar to the NCBS, but most of the programming involved various programs designed to address child/family poverty such as early childhood education or increased work attachment through child care and earning supplements.

[8]   See Milligan & Stabile, 2007, for estimates of this provision on labour supply.
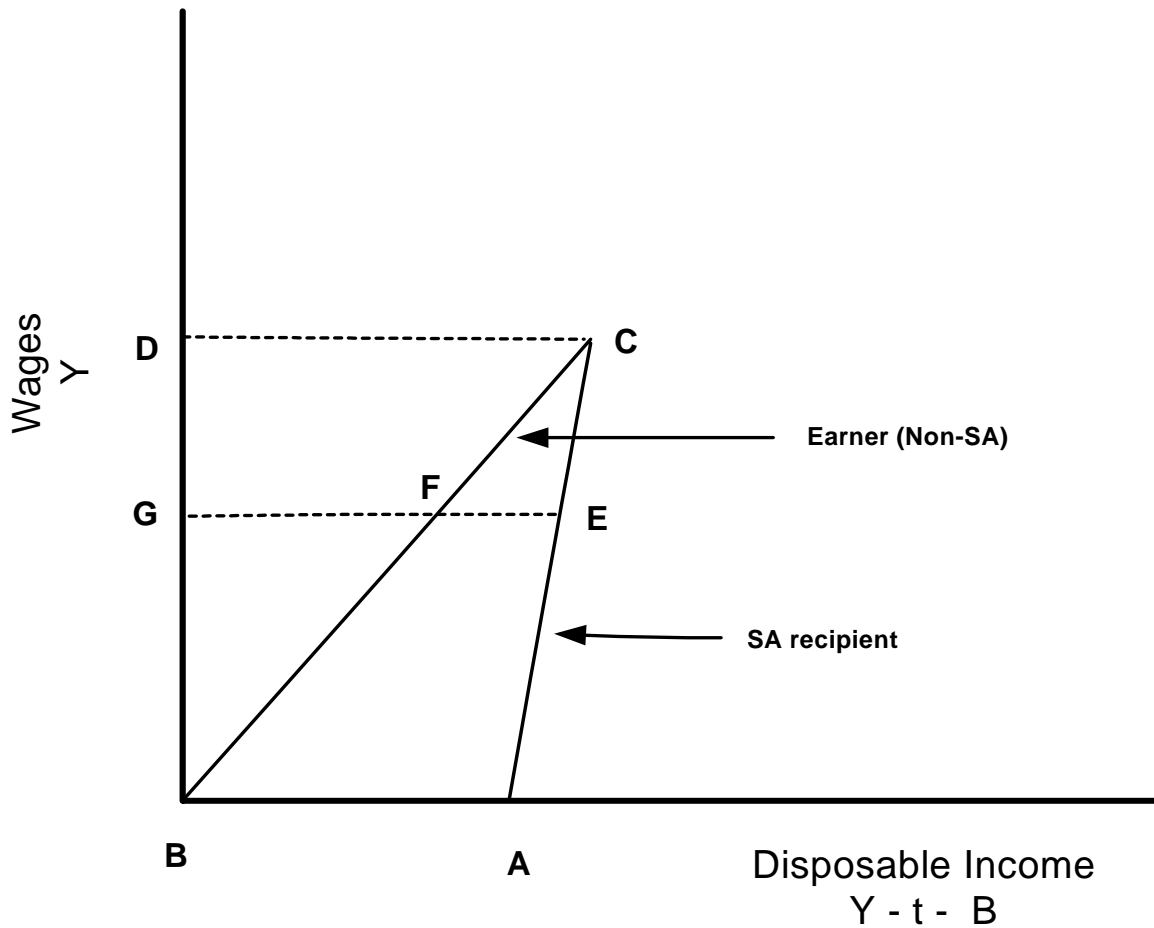
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Wages
Y

Disposable Income
Y - t - B

D   C

Earner (Non-SA)

F
G   E

SA recipient

B   A

Figure 1
Measuring the welfare wall

Empirical measurement of the welfare wall

The main challenge in measuring the welfare wall using a marginal tax rate perspective is to enumerate SA benefits plus the various income-tested programs (financial and non-financial benefits) open to both SA recipients and low income families. For a complete picture, the disposable income needs to be calculated for all low income families (on SA and not) within a jurisdiction, taking into consideration all the main elements, including:

- net earnings (earnings less deductions such as income tax, EI, CPP, etc.)

- federal and provincial child benefits (as applicable)

- direct SA cash benefits

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- credits such as cost of living, shelter allowances, GST rebates, etc.

- the value of child-care subsidies

- the net value of income-tested programs (subsidies) in health, housing, transportation, recreation, etc.

Most estimates of the EMTR capture the first four elements by applying the taxation and program eligibility to typical families receiving SA. However, a complete calculation must also include the value of all other benefits. It is possible to calculate how gross earnings translate into disposable income for those who are on SA compared to those who work; however, this calculation presents important data challenges. First, programs may be available for both SA and other low income families. For example, many SA recipients do not live in subsidized housing, and not all residents of subsidized housing are SA recipients. Programs such as health coverage or subsidized child care may be income-tested and available to both SA recipients and other low income families. Second, programs — even those programs that are directed only to SA recipients — may not be fully subscribed, and therefore, not all families will receive benefits.[9] In order to account for this, complex probability modelling would be needed to distribute the benefits across various SA clients. Finally, complete enumeration would require very detailed information at the jurisdictional and family level (e.g., programs, benefits, and eligibility between jurisdictions). Similarly, family eligibility or status may not be clear. For example, family income may consist of a combination of earned income and partial assistance.

No matter how meticulous the accounting, a direct estimate of the welfare wall using the EMTR is likely to be incomplete. The fact that the take-up rate for many programs is difficult to estimate will alone produce a biased measure. People are not always rational or fully-informed, and the EMTR (the welfare wall) varies with individual subjective preferences and capacity to know all programming for which each individual might be eligible. Clearly, a substitute measurement strategy has value.

Some critics assert that it is inappropriate to assume that MTRs are the basis for work-leisure trade-off decisions (see Caniglia, 1996; Battle & Torjman, 2000; and Bird & Smart, 2001). They cast doubt first on the usefulness of empirical estimates of the EMTR as a measure of the welfare wall, and second on the assumption that SA recipients fit the "rational decision-maker model." The critique is not directed at the rationality of SA clients *per se*, but rather at the narrow precepts of economic analysis and its reliance on the price/tax system as the sole factor in the decision-making of SA recipients.

Qualitative research on how low income workers view MTRs shows that the reductions in SA benefits create disincentives to work. Romich (2006) uses ethnographic data from 60 families to reveal their understanding of marginal tax rates. Focus groups conducted by the author (NCB, 2003b) revealed that some mothers express a preference for parenting their children, especially those with disabilities; for them, it makes sense to endure the financial costs of reduced work effort in exchange for the perceived long-term benefit of spending more time with their children. Other working parents freely admitted that their decision to work made no financial sense and that they would be better off on SA. Therefore, it is incorrect to assume that all SA clients view the welfare wall as a simple calculation that sums net financial benefits received. A range of personal preferences and family constraints/opportunities clearly influence the decision to work.

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[9]   The focus groups confirm that many SA clients are unaware of programs and services that are available without charge or at a reduced charge for those with low income (see NCB, 2003b).

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The reservation wage as a direct measure of the welfare wall

The reservation wage represents the wage a worker would require to give up an additional hour of leisure to work that hour (Hammermesh & Rees, 1984; Lancaster & Chesher, 1983; Mortensen, 1986; Blackaby et al., 2007). The standard view is that the reservation wage varies with the wages offered, the number of jobs available, and the costs of searching for work. Search costs depend on personal circumstances, the opportunity cost of search time, and the technology that firms use to publicize the availability of work. It is the lowest wage at which a person would accept a formal paid job. Although the work–leisure trade-off is common to labour supply research, for many low income households receiving income support, the alternative to formal paid work is increased parenting time, which few regard as "leisure."

The reservation wage is a subjective value influenced by many factors such as:

- the nature of the work sought (with dangerous employment and "off-hour" work requiring a higher wage)

- distance to the job

- other income earned by the household

- the hours presently spent in formal paid work

- the duration of present unemployment

- the flow of job offers and perceived availability of employment

- the length of prior employment, the wage earned, and the level of savings

- other family responsibilities, etc.

Although the concept of a reservation wage is clear, empirical estimation remains challenging. One measure of reservation wages uses macro data to infer the reservation wage from equilibrium market positions of wages and employment. These studies require some intricate econometrics to control for simultaneous equation bias, sample selection, and institutional rigidities (Lancaster & Chesher, 1983; Blackaby et al., 2007).

Other empirical approaches use survey data; for example, Feldstein and Poterba (1984) used supplementary questions added to the Current Population Survey (CPS),[10] and found that 30% of persons who were laid off reported reservation wages above the pay rate of their prior employment. Feldstein and Porterba also found that this differential was a positive function of the proportion of previous income covered by unemployment benefits. They modelled the reservation wage ratio as a function of various income and demographic independent variables.

In another survey-based measure of the reservation wage, Ryscavage (1987) used the 1984 panel of the Survey of Income and Program Participation (SIPP).[11] Unemployed

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[10]   The Current Population Survey is available at http://www.bls.census.gov/cps/cpsmain.htm
[11]   The SIPP is a longitudinal household survey that collects detailed information on the economic situation of households and persons in the United States. See http://www.sipp.census.gov/sipp/ for details.

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participants responded to questions about their reservation wage, job search, and reasons for not participating in the labour force. The reservation wage questions were included with questions on child care, welfare history, child support, support for non-household members, and work-related expenses as part of SIPP's "topical module." Table 1 shows the main questions used on the SIPP study. As with all omnibus-type surveys, the demands of other study objectives limited the number and detail of the reservation wage questions.

Table 1
Main "reservation wage" questions on SIPP

Were you on layoff from a job during that week?
For how many weeks had you been on layoff up until that time?
What wage or salary were you receiving at the time you were laid off that job?
Were you looking for a full-time or part-time job?
Did you contact any employers during the last month in person, by mail, or by telephone?
How many different employers did you contact?
What kind of job were you looking for?
What wage or salary did you expect to receive for this kind of work?
What is the lowest wage or salary you would have accepted (for this kind of work)?
What would you say is the main reason you did not look for work during the last month?
If you do look for work, will you look for a particular kind of job?
What wage or salary do you expect to receive for this kind of work?
What is the lowest wage or salary you would accept (for this kind of work)?

Several limitations exist with the Feldstein-Poterba study. Only those who had experienced a job loss because of a layoff and were looking for work answered the questions. Space limitations prevented inclusion of questions that identified the reasons for unemployment.[12] Other limitations of the study included the usual non-response associated with all surveys and the fact that not all persons who were unemployed participated in the survey. Using the reservation wage ratio[13] (the dependent variable used by Feldstein and Poterba), Ryscavage showed that approximately 2.5 million persons had a reservation wage below the US federal minimum wage in 1985 of US$3.35 an hour.

In another recent study, Heath and Swann (1999) used a cross-sectional survey of Australian job seekers to assess whether reservation wages that are set too high could explain prolonged unemployment. To the contrary, they found that long spells of unemployment appear to arise from a deficiency of demand (i.e., too few offers) and not because job seekers are too choosy or set unrealistic reservation wages. Delays between job offers should lower reservation wages, but Heath and Swann could not test this hypothesis using the cross-sectional data available to them.

Finally, Prasad (2000) used the German Socio-economic Panel (with about 400–500 participants annually) to assess the determinants of the reservation wage and its relationship to the duration of unemployment. Administered to unemployed respondents between 25 and 55 years of age, the key question was, *"How much would the net pay have to be for you to consider accepting a job that was offered to you now?"*

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[12] The survey excluded those who quit, those who were re-entering the workforce after a time away (e.g., maternity), and those who were entering for the first time. Those who quit likely have high reservation wages, and new entrants often "under price" themselves.

[13] Ratio of reservation wage to previous employment wage.

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Prasad used a two-stage process, first estimating the reservation wage (as provided by survey respondents) as a function of a range of independent variables, then estimating the duration of unemployment as a function of the estimated wage (for each respondent) and other independent variables. Using instrumental variables, he found that the reservation wage was a statistically significant determinant of unemployment duration. He also found expected relationships in the determination of the reservation wage.[14]

Discrete choice approach to estimating the reservation wage

The survey-based studies on the reservation wage all use a direct question such as, *"How much would the wage need to be for you to accept a position now?"* A direct parallel exists in market research analyses, where a consumer might be asked, *"How much are you willing to pay for product 'X'?"* Market researchers have long recognized that directly posing a pricing question risks strategic response bias, when the respondent purposely under- or overstates his/her willingness to pay in an attempt to sway results of the research.

A discrete choice questionnaire structure attempts to counter this bias. Respondents simply agree or disagree to a specific question: "Would you accept a job at $Y per hour"? Those who respond "YES" can be asked whether they would accept a job at a test wage of $Y – $1, and those who reply "NO" may be tested with $Y + $1. The percentage of respondents who answer YES (i.e., they would accept a job) may be plotted against the three test wages: (Y, Y – $1, Y + $1).

A further refinement of this technique randomly allocates respondents into more than one test price, where the sequence can be repeated. If one uses three test wages $X, $Y, and $Z, with the "NO"s being tested at a higher wage (e.g., $X + $1, $Y + $1, and $Z + $1) and the "YES"s at a lower wage (e.g., $X - $1, $Y - $1, and $Z - $1), one can assess the response across nine points.

Two methods of analysis exist.

- Because respondents are randomly allocated to the test wages, it is possible to use these prices as "least wage" observations for the dependent variable in a regression. Independent variables will include the various income, household, and personal characteristics. This approach assumes that the test wage is the lowest wage at which the respondent will accept work; however, this is, strictly speaking, not accurate. Someone agreeing to work at $10 per hour may actually be prepared to accept a job at $9.50 per hour, but without direct testing, there is no way to measure this.

- It is also possible to use a probability model, where the decision to accept/reject a position becomes a 0–1 dependent variable in a logit or probit estimate with the usual independent variables as cited above plus the test wages associated with agreement and disagreement. This model allows one to calculate the probability of accepting a job if the wage increases by $1, as well as the marginal impact of other independent variables on the probability of working.

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[14]   For example, marriage and the presence of children reduce the reservation wage, while a university degree raises it significantly.

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Several general caveats are important. First, a comprehensive test of reservation wages consumes many questions on a typical survey. As with the other survey-based studies of reservation wage reported here, the other objectives of a questionnaire constrain the number and structure of the reservation wage questions. Second, it is impossible to design a set of reservation wage questions that matches each respondent's situation. Some will eagerly work at the lowest wage offered, and others will not work at any of the wages offered. The hope is that the researcher chooses a range such that the respondent will switch from non-work to work at some point within the test range. Third, the discrete choice approach only supports a finite number of test wages. In contrast, the standard approach of asking the respondent the minimum wage at which he/she would accept a job could produce a unique wage for each respondent. In the discrete choice model, respondents can assess only a small number of test wages. Wages are only one aspect that a prospective employee considers in deciding to accept a specific job (in addition to hours, location, etc.). It is not possible to include all elements of a job that encourage or discourage acceptance. Finally, other respondent co-variates affect the decision to work, such as employment histories, all other sources of income, availability of child care, socio-economic attributes, etc., but it is impractical to collect data on *all* the determinants of the respondents' willingness to work.

In contrast to these caveats, the discrete choice approach also has an important advantage in that it reduces the strategic bias inherent in simply asking respondents the wage they need to work. It poses the question the way a prospective worker receives a wage offer as opposed to the respondent 'naming his or her price.'

Factors in the willingness to work

The data platform for this study was a survey of clients receiving the National Child Benefit Supplement (NCBS). In brief, this survey involved phone interviews with 5,800 NCBS clients during 2003. The sample frame rested on an enrolment conducted by Canada Revenue Agency of randomly selected tax-filers who reported receiving the NCBS in the previous tax year. Potential respondents received a letter with a mail-back card indicating their consent to participate. Details of the survey appear in NCB, 2003a.

Before posing the reservation wage questions, the questionnaire explored the barriers and influences that affect NCB clients' willingness and ability to accept employment. Table 2 shows the factors that respondents said influence their decision to work.[15] Note that all respondents, except those who stated that they were retired or disabled, responded to this question.

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[15]   Note that Table 3 contains unweighted data. At this time, final decisions on weighting have not been made. These results provide context and information provided by respondents. They are not representative of the NCBS client population.

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Table 2
Factors of importance when deciding about work

	Very important	Somewhat important	Not that important	Not at all important			
	4	3	2	1	DK/NR	N/A	
	%	%	%	%	%	%	
	n	*n*	*n*	*n*	*n*	*n*	Mean
	74%	22%	3%	1%	1%	-	
Wage rates	*3,673*	*1,080*	*123*	*56*	*44*	-	3.7
	61%	30%	6%	3%	1%	-	
Number of hours the job requires	*3,028*	*1,477*	*273*	*149*	*49*	-	3.5
	67%	19%	7%	6%	1%	-	
Shifts job requires	*3,352*	*940*	*344*	*295*	*45*	-	3.5
	64%	9%	5%	11%	1%	10%**	
Availability of child care	*3,196*	*450*	*234*	*543*	*37*	*516*	3.4
	60%	13%	5%	11%	1%	11%**	
Cost of child care	*2,983*	*639*	*234*	*549*	*41*	*530*	3.4
Amount of income tax deducted	35%	32%	16%	16%	2%	-	
from cheque	*1,738*	*1,573*	*782*	*778*	*105*	-	2.9
Whether family will move into	29%	31%	18%	19%	4%	-	
higher tax bracket	*1,435*	*1,537*	*895*	*935*	*174*	-	2.7
Loss of benefits received from	29%	16%	17%	37%	2%	-	
Social Assistance*	*354*	*196*	*212*	*455*	*26*	-	2.4

Note: Horizontal percentages may not sum to 100% due to rounding.
* Only those on SA in the last year
** Children over 12 years of age, respondents are able to make other arrangements, etc.

Respondents indicated that tax issues are much less important than the exact wage rate, the hours of work, whether the job involved shift work, and the cost and availability of child care.

Implementing the discrete choice-based reservation wage

Since the NCB is a national survey, it had to meet several conditions.

- The test reservation wages on the client survey had to vary from region to region within Canada because, for example, using a test wage of $6 per hour might elicit less response in Toronto than in rural New Brunswick. We elected to use the minimum wage in each province and territory as the base wage for that jurisdiction and then test progressively higher wages.

- An asymmetric approach to testing wages randomly allocated unemployed respondents in each jurisdiction to one of three test wages: the provincial minimum wage, 1.5 times the minimum wage, and 2 times the minimum wage, as shown in Table 3. Respondents in each jurisdiction could be offered one of the three wages.

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Table 3
Test wages by jurisdiction ($)

Jurisdiction	Low (Min wage)	Medium (1.5 x Min)	High (2 x Min)
Newfoundland and Labrador	5.50	8.25	11.00
Prince Edward Island	6.00	9.00	12.00
Nova Scotia	5.80	8.70	11.60
New Brunswick	5.90	8.85	11.80
Ontario	7.00	10.50	14.00
Manitoba	6.85	10.30	13.70
Saskatchewan	6.25	9.40	12.50
Alberta	6.00	9.00	12.00
British Columbia	8.00	12.00	16.00
Yukon	7.20	10.80	14.40
Northwest Territories	6.50	9.75	13.00
Nunavut	6.50	9.75	13.00

- Respondents who rejected the test reservation wage then responded to a second test wage $1 higher than the initial test wage. Therefore, a respondent in Alberta could be allocated randomly to one of three initial test wages: $6, $9, or $12. If the respondent declined to accept a job at the initial wage, the wage offer rose to $7, $10, or $13, depending on the initial test wage assignment.

- Because of survey time constraints, and in order to avoid adverse respondent reaction, respondents who accepted jobs at their initial test wage did not receive an offer at a lower wage.

- For those who declined a position at both test wages, we asked them the standard reservation wage question: "If you would be willing and able to take a job, at what hourly wage would you accept that job?"

- We posed reservation wage questions to both NCBS clients who were unemployed at the time of the survey and NCBS clients who were employed (asking them to consider additional employment). However, empirical testing includes *only* respondents who were not employed at the time of the survey.

To counter the well-known strategic bias associated with direct questions about willingness to work, interviewers could not pose the question outright; the question had to be more circumspect and circular. Setting up the proper experiment required a degree of trial and error to find the appropriate range of test wages that would elicit reasonable responses in the context of a phone survey. Part of that process was the exploration in the questionnaire of the factors that affect the willingness to work.[16] Based on this it was possible to develop a discrete choice experiment to empirically estimate willingness to work at various test wages.

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[16]   The complete questionnaire text is available in NCB (2003a).

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Throughout this estimation exercise, we estimated models for the following groups:

- entire sample (with a dummy variable to indicate whether the respondent was single/divorced/widowed or married/common-law)

- single parents

- dual parents

- clients who had received SA in the last year

- clients who had not received SA in the last year.

Table 4 shows the variables used in the analysis.

Table 4
Variables from survey data

Variable name	Description
ACCEPT	The wage at which the respondent accepted work (only in the logit specification)
AMOUNT	Amount of the test wage, and amount of the test wage + $1 (logit)
CHILDREN $\leq$ 6	Number of children 6 and under
CHILDREN $\geq$ 7	Number of children between 7 and 18 (inclusive)
EDUCATION*	One of ten ordered educational levels
AGE	Age of respondent in years
STATUS	Aboriginal or visible minority (0 = no, 1 = Aboriginal)
COURSE	Whether respondent had taken a training course in the last year (0 = no, 1 = yes)
DISABLED	Presence of a disability in the home, parent or child (0 = none, 1 = disability)
UNEMPLOY	Unemployment rate for the province
MARITAL	Marital status (0 = single [including divorced, separated, widowed], 1 = married [including common-law])
SA status	Social assistance receipt (0 = not in the last year, 1 = in the last year)

Note: The correlation matrix for this set of independent variables revealed very low values.
*1 = grade 8 or less; 2 = grade 9 or 10; 3 = grade 11, 12, or 13 (not graduated); 4 = graduated high school 5 = Masters/PhD degree

Table 5 shows the mean value of the estimated reservation wage for the unemployed respondents. This estimate represents the average of the lowest test wages that a respondent stated they would accept for a job. It also included the stated reservation wage for those who declined work at either of the two test wages we offered. These estimates may be biased upward somewhat by the nature of the discrete choice model, where some respondents accepted work at 1.5 times and at 2 times the minimum wage when they might have been prepared to commit at a lower wage, had it been offered.

Table 5
Reservation wage
(Computed as the test wage accepted or the reservation wage offered if both test wages rejected)

Group	SA*	Non-SA	Total
	(Sample size in brackets)		
All clients	$9.97	$10.67	$10.39
	(711)	*(1,011)*	*(1,728)*
Single parents	$10.04	$10.77	$10.33
	(509)	*(302)*	*(814)*
Dual parents	$9.79	$10.63	$10.44
	(202)	*(709)*	*(914)*

* Receipt of SA in the last year (prior to interview date)

Table 5 also reveals that the reservation wage for NCBS clients lies between $9.79 and $10.77, well above the minimum wages prevalent in 2003. Those who have not received SA in the last year have higher reservation wages than those on assistance. In addition, single parents — SA and non-SA — have higher reservation wages than dual parents (married or common-law), but not by much.[17] This may reflect the added costs associated with child care for a single parent or the effect of the other parent's earnings for dual parents.

We attempted two further estimation strategies for the reservation wage in the context of the NCBS client survey.

- ***Probability model.*** This approach used a logit model, where the dependent variable indicated whether the respondent accepted the wage offer. Each respondent supported two observations: one at the initial test wage ($X) and another at the test wage + $1 ($X + $1). If the respondent accepted at the initial (lower) test wage $X, we assumed that he/she would also work for $X + $1, and the two observations for that respondent would have both dependent variables coded as 1. For respondents who rejected the test wage and the test wage + $1, we set the two dependent variables equal to 0. This hybrid dataset produced two observations for each respondent and effectively doubled the number of observations in the original number of unemployed respondents who answered the survey questions.

- ***Standard reservation wage model.*** Of those who rejected both test wages, we simply asked the standard reservation wage question and used this as the dependent variable in a regression with various socio-economic variables.

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[17] With respect to single and dual parents, note that Simpson's Paradox can be seen in Table 4, where single parents in each subgroup (SA and non-SA) have higher average reservation wages than dual parents. In aggregate, the effect is reversed.

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A logit model provides a useful insight into the effect of the reservation wage on the probability of working. We constructed the dependent variable as described above, and Table 6 presents the model and the diagnostics.

Table 6
Logistic regression results – reservation wage
(Total sample n = 4,392)[18]
Dependent variable = 0 or 1 based on acceptance of a job at the test wage (ACCEPT)

Variable	B	Wald	p
CONSTANT	−.856	10.055	.000
AMOUNT	.216	298.730	.000
CHILDREN < 6	−.337	48.916	.000
CHILDREN > 7	.054	2.229	.136
EDUCATION	−.066	20.723	.000
AGE	−.023	26.586	.000
STATUS (= 1 if Aboriginal or visible minority, 0 otherwise)	−.385	17.152	.000
COURSE (= 1 if yes in last year, 0 otherwise)	.140	3.325	.068
DISABLED (= 1 if disability in household, 0 otherwise)	.717	89.822	.000
UNEMPLOY (Provincial unemployment rate)	.053	48.298	.000
MARITAL (0 = single, 1 = dual parent)	−.086	1.289	.256
SA Status (0 = not in last year, 1 = in last year)	−.583	55.049	.002
Goodness of fit	4515.56		
Nagelkerke R^2	.185		
Percent correctly classified	67.26%		
Chi-square *(p value)*	32.633 *(.000)*		

Overall, these are reasonably robust results. In this estimation, all coefficients are significant except for children ≤ 6, and Marital Status. Whether someone reported having taken a course in the last year or not is marginally significant with a p-value of .068

The interpretation of the coefficients produced by a logit model requires care. A logit model (and a probit model) assumes that the change in probability of observing a behaviour (here the respondent reporting that he/she would accept a job at the offered wage) diminishes as one moves away from the mean value of an independent variable. In contrast, a standard linear regression model assumes that the dependent variable changes at a constant rate throughout the range of the independent variable(s). Therefore, the usual practice is to evaluate the logit model at the mean value of the independent variables.[19] One can approximate the marginal impact of a unit change in the independent variable (at a mean value of the dependent variable, which is often assumed to be .5) by dividing the logit coefficient by 4. This is a general rule that may not suit the sample if the independent variables are not symmetric about their means and if the average value of the dependent variable diverges from .5. Alternatives are to compute the marginal effect at the median or

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[18]   This sample is "doubled-up," as described above, and also reflects automatic deletion of observations with missing data on one or more variables.

[19]   In a general way, this is because the logistic model forms an "S" curve that is compressed between 0 and 1 on the vertical axis and the range of the independent variable(s) on the horizontal axis. The point of inflection for the "S" reaches maximum steepness at the mean of the independent variable(s), which is why most interpretation of the coefficients occurs at the mean value of the independent variable(s).

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modal values.[20] Here the mean value of the dependent variable is .56 so we can safely use the simple rule of dividing by 4.

Interpreting the marginal changes for a dummy variable is more problematic since they change from 0 to 1, and a mean value makes little sense. A common approach is to simply note whether the sign is in the correct direction and whether the variable is statistically significant. However, here we follow the example presented in Pampel (2000, p. 27).[21]

Table 7 presents the impact of a marginal change in the independent variable on the probability of accepting a job at a specified wage.

Table 7
Estimated marginal impact on probability of accepting a job

Variable	Marginal impact (change in probability)*
AMOUNT	.05
CHILDREN < 6	−.08
CHILDREN > 7	Not significant
EDUCATION	−.02
AGE	−.01
STATUS (Aboriginal or visible minority =1, 0 otherwise)*	−.09
COURSE (= 1 if yes in last year, 0 otherwise)**	.03
DISABLED (= 1 if disability in household, 0 otherwise)*	.16
UNEMPLOY (Provincial unemployment rate)	.01
MARITAL (0 = single, 1 = dual parent)*	Not significant
SA Status (0 = no, 1 = dual parent)*	−.14

  * Dummy variable contribution calculated using change of probability for omitted and dummy variable group. Other variables calculated at $p = .5$.
  **Marginally significant.

Table 7 shows that a $1 change (increase) in test wages / wages offered will increase the probability of participating in the workforce by .05, while an additional child under six reduces this likelihood by .08. The addition of children over six makes no difference to the probability of labour force attachment. An additional step in the educational ladder *reduces* the probability of working by .02. This apparently contradictory result may be due to the way in which education data are collected in the survey (as an ordinal scale, not a continuous scale). It could also reflect that more educated people tend to be "pickier" and wait for better jobs. Older NCBS clients have a slightly lower likelihood of working, and older clients are less likely to have children under the age of six.[22] Being Aboriginal or belonging to a visible minority reduces the likelihood of working by .09, while having taken a course in the last year increases the likelihood of working by .03. The largest impact on willingness to take a job is whether a disability exists in the house; this increases the probability of working by .16. A respondent who is married or living common-law is less likely to work by .02. A respondent who had collected SA in the last year is .14 less likely to accept a job.

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[20] Some analysts dispute the value of calculating marginal effects (Demaris, 1992) arguing that these models are useful only for sorting out the impact of the independent variable in a general way.

[21] For dummy variables, it is possible to compute the probability of the dependent variable of the group without the dummy variable ("omitted group") and subtract that from the probability of the dependent variable for the dummy variable group.

[22] Note that simple correlations among the variables reveal very low values.

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For the most part, these results appear reasonable. However, it is important to bear the following in mind:

- The survey collected respondents' reported willingness to accept a job at a stated wage. This is not the same as observing whether a respondent actually accepts a job if it is offered at that wage. Stated preference is not revealed preference.

- The high positive impact of a disability in the household on the willingness to work needs to be placed in the questionnaire context, where we offered respondents a full-time or part-time job at a specified wage. It may be that many who are disabled or have a disabled person in their household (this variable includes both) are keen to work part-time and may accept lower reservation wages. Unfortunately, we cannot explore this idea within these data.

- Having recently taken a course tends to increase the likelihood of accepting a job and may reflect the job readiness of those who participate in education and training. At the same time, those with higher levels of education appear to be slightly less willing to accept a job.

Overall, these results show that increasing wages tends to increase the willingness to work, but other factors both counter and reinforce this tendency. The next section explores the reservation wage in a more conventional setting.

Standard reservation wage model

Those who rejected both test wages were asked to provide a wage at which they would take work.[23] We treated this as a conventional reservation wage, similar to the work of Ryscavage, cited above. Table 8 shows the average value of this wage for the subsets tested in this analysis. In general, those who are on SA have lower reservation wages than those who are not, and those who are married or common-law have lower reservation wages than those who are single. This aligns with common perceptions of willingness to work.

Table 8
Hourly reservation wage
(Those who were unemployed and who had rejected both test wages)

Group	SA	Non-SA	Total
All	$10.99	$13.47	$13.13
Single parent	$11.10	$13.91	$13.41
Dual parent	$10.70	$12.96	$12.77

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[23] We did not include respondents who indicated that a disability prevented them from accepting a job at test wages.

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Table 9 presents an ordinary least squares (OLS) and two-stage least squares (2SLS) regression of reservation wage, against a standard set of independent variables. In the 2SLS, the monthly amount of CCTB is included as an endogenous variable, with total household income added as an instrument, along with the independent variables.

Table 9

Reservation wage – direct question

Dependent variable: At what hourly wage would you accept a job? (Asked of unemployed persons who had declined both test wages)

Variable	B values	
	OLS	2SLS
CONSTANT	5.691**	4.852**
CHILDREN ≤ 6	.601**	.702**
CHILDREN ≥ 7	−.163	−.119
EDUCATION	.507**	.524**
AGE	.111**	.121**
STATUS (Aboriginal or visible minority =1, 0 otherwise)	1.023**	.887
COURSE (= 1 if yes in last year, 0 otherwise)	1.067**	.901**
DISABLED (= 1 if disability in household, 0 otherwise)	.240	.053
UNEMPLOY (Provincial unemployment rate)	.009**	.071*
MARITAL (0 = single, 1 = dual parent)	−1.025**	−.842**
SA Status (0 = no, 1 = dual parent)	−1.739**	−2.035**
CCTB (Monthly amount of CCTB received)		.00002
Adjusted R^2	.152	.143
F (p value)	29.365 (.000)	24.735 (.000)

* Significant at .005 level.
** Significant at .001.

Table 9 reveals the following:

- The OLS and 2SLS results are very similar in both the magnitude and significance of the coefficients.

- Within this cross-sectional dataset, the amount of CCTB is statistically insignificant, which indicates that this monthly payment does not influence the reservation wage and therefore does not raise the welfare wall. This finding is important because, had the coefficient been statistically significant, large, and positive, the implications would have been that the CCTB raises the welfare wall and reduces workforce attachment.

- The remaining results reference the OLS column of Table 9.

  Each child under six adds $0.60 to the reservation wage base of $5.691. The presence and number of children six and over makes no difference to the required wage.

  Each level of formal education adds $0.51 to the required wage. Recall that we used an ordinal, ten level measure of education. Therefore, for someone with the highest level of education (graduate degree), the reservation wage would rise by $5.10 over the base value.

  Each year of respondent age adds $0.11, which translates into an additional $3.85 for the average-aged respondent (35 years).

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Being Aboriginal or a visible minority adds $1.02, while having taken a course in the last year adds $1.07.

Respondents in dual parent households have average reservation wages that are $1.03 lower, and respondents who had received SA in the last year have reservation wages that are $1.74 lower.

Finally, Table 10 provides examples illustrating the predicted reservation wage for various types **of hypothetical respondents.**

Table 10
Predicted reservation wage of NCBS clients who are presently unemployed*
Respondent attributes

	Number of children ≤6	Highest level of education	Age	Aboriginal/ visible minority	Course in last year	Marital status	SA in last year	Predicted reservation wage
1	1	4 (High school graduate)	21	No	No	Single	Yes	$8.90
2	2	3 (Grades 10–12)	24	Yes	Yes	Dual Parent	No	$7.74
3	1	9 (University graduate)	26	No	Yes	Single	No	$11.96

* Only statistically significant coefficients included from Table 8.

The estimated wages generally exceed the minimum wages in each province/territory, but they are lower than the averages presented in Tables 4 and 8. This regression model explains 15% of the variation (R^2 = .152) in stated reservation wage. Clearly other factors not included in the survey contribute to a bias in these estimates (omitted variable bias). This reflects the constraints in collecting a large number of possible explanatory variables in a telephone survey. Also, these welfare wall questions were inserted into a survey that had to fulfill many other goals. It also reflects the diversity of respondent situations where a myriad of personal factors, not captured in the phone survey, influence the willingness/ability to work.

Summary and conclusions

Income support policies typically attempt to increase work participation. The welfare wall is important to the program design for the NCB simply because many NCBS clients are on SA (about 25% in the last year) and face the welfare wall, and because income security policies affect the welfare wall. The welfare wall, either measured directly by calculating the EMTR of those on SA or measured by the reservation wage of those who are unemployed (either on SA or not), is a useful way to understand various influences on the decision to work.

The specific questions about *the reaction of NCBS clients to design and delivery of NCB component programs* and *to what extent has the NCB promoted the labour force attachment of parents* are dynamic issues that commonly require both a comparison group and observations over time. However, using the assumption that families do move through similar life cycles, cross-sectional data can offer an additional line of evidence about the reaction to changed program features. The regression parameters derived from cross-sectional data are *long-run* impacts, whereas the estimates obtained from time-series data (where we observed participants at two or more points in time) are *short-run* impacts. The long-run effect of children maturing and entering school on the labour supply of parents

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may be inferred from cross-sectional data. For example, the eventual labour supply and willingness to work of a parent with children under six may be inferred from the behaviour of those whose children are older.

This paper attempts to move the discussion of the welfare wall beyond technical considerations of benefit levels and reduction rates by including socio-economic factors specific to households. Using the reservation wage to model the welfare wall and labour market behaviour provides useful insights. Specifically, it reveals the personal and family factors that affect the reservation wage and shows how the perceived barriers to work (i.e., the height of the welfare wall) vary among individuals. Survey techniques allow the household to provide a direct measure of the wages needed to induce increased attachment to the labour force. This research confirms what many researchers and social activists maintain about the welfare wall. The wage required by those on SA to leave the program exceeds the minimum wage typically offered. Further, the reservation wages, while falling for those with lower education, may be higher than many respondents can expect based on their training and experience. Critical drivers that raise the welfare wall are the number of children under six, the educational level of the individual, and whether or not one is Aboriginal or a member of a visible minority. Factors that lower the welfare wall for a respondent include being in a dual-parent household and having received SA in the last year.

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