The Effect of Asset Thresholds on Income Assistance Flows in British Columbia

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1. Introduction

Across Canada, provincial social assistance programs (also sometimes referred to as "welfare", or "funders of last resort") impose asset tests for both applicants and recipients of social assistance. That is, in order to qualify for and remain eligible for social assistance, the assets held by the household must remain below a certain threshold that is usually set quite low. There are two main reasons why social assistance programs apply asset tests. First, it is believed that asset thresholds contribute to better program targeting, ensuring that those with high assets cannot access social assistance. This is consistent with the notion that social assistance be a 'funder of last resort' and that asset thresholds are needed to 'police' entry into social assistance. Second, there is a widely held notion that asset tests motivate exit from social assistance. This is consistent with the notion that recipients who can build an asset base while on social assistance will leave social assistance once they reach the asset threshold in order to keep accumulating assets. From these perspectives, asset tests are considered to be 'good policy.'

However, asset tests are controversial for several reasons. First, asset tests incentivize vulnerable households to draw down their already few assets in order to access social assistance. Second, they incentivize social assistance recipients to maintain a low asset base, causing them to remain vulnerable to financial shocks. Third, recipients that exceed the asset base may pre-maturely exit social assistance before they are able to establish a secure financial foundation, leading to re-entry into social assistance. From this perspective, asset tests can instead be considered 'bad policy.'

Despite the widespread use of asset tests in social assistance programs, little empirical research has been conducted to examine whether asset tests fit the viewpoint of being good policy or fit the viewpoint of being bad policy. This paper helps fill this gap by examining how a change to the asset test affects social assistance caseload flows, specifically new entries, re-entries, and exits. In particular, we exploit an increase in the asset threshold for social assistance recipients in British

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Columbia (B.C.) to study the effect of more generous asset thresholds on social assistance new entries, re-entries, and exits. B.C's social assistance program is called Income Assistance (IA) and it provides a monthly cash transfer and other supports (as needed) to persons and families who have no or very little other sources of income to help them cover their basic needs. In October 2012, the asset thresholds used for the IA asset test increased. To examine the effects of this change, we use recipient level administrative data from the B.C. IA program from the years 2002–2017 inclusive. This data is made available through the Data Innovation Program that is supported by Population Data BC.

Our hypotheses are as follows. First, if asset tests are effective at policing entry, new entries should increase when the asset threshold increased. Second, if asset thresholds are effective at motivating exit from social assistance, we expect exits to decrease after the asset threshold increase. Third, if those exiting social assistance after the asset threshold increase are doing so with a stronger asset base, the amelioration function, then we would expect these recipients to have a lower re-entry rate.

Our results show that the increased asset thresholds in B.C. had very little effect on new entries and re-entries. For new entries, our results find that the increase in the asset threshold did not have a statistically significant effect—the asset threshold is not statistically significant in policing entry. For re-entries, the increase in the asset threshold did have a statistically significant impact but the magnitude of the effect was tiny. The effect of the increase of asset thresholds on exits was statistically significant and somewhat large suggesting that asset thresholds may motivate exit from social assistance; however, due to the implementation of an earnings exemption at the same time, it is possible that the earnings exemption also decreased exits. The major policy take-away from our results is that asset thresholds have little policy rationale: asset thresholds do not police new entries nor do they influence re-entries. This suggests that further increases in the asset threshold for B.C. IA recipients is unlikely to have a large effect on entry but could reduce the administrative burden and alleviate some of the fear recipients have towards increasing their savings.

This research builds on research on asset tests conducted in the US where changes to asset thresholds using the Temporary Assistance for Needy Families (TANF) has been studied.[2] Increasing or eliminating TANF asset thresholds has been shown to have no effects on caseloads, the number of monthly applicants, acceptance rates, nor on participations rates (Hamilton, Alexander-Eitzman, and Royal 2015; PEW Charitable Trusts 2016; Pirog, Gerrish, and Bullinger 2017). While instructive, this literature does not differentiate between entries and exits. By failing to do so it is possible the lack of significant results could be driven by the fact that there could be both an increase in entry (either due to first entry or re-entry) and an increase in exit that these approaches are disguising, leading to the lack of significance in the empirical measures.

[2] TANF is a block grant program created in the U.S. that provides funding to states and territories to provide monthly cash transfers to low-income families with children (Congressional Research Services 2020). Within the general parameters of TANF set by the federal government, states have broad authority to set eligibility requirements, including asset thresholds and this variation has been used in empirical research to test the effect of asset thresholds on TANF caseload.

Further, this paper builds on the literature that examines the relationship between asset tests and household asset accumulation. Examining changes in TANF asset limits, the literature has found that when time since an asset limit changes is included in the model, there is a statistically significant increase in: the number of and probability of a household owning a bank account, total wealth, net wealth, net worth, and savings (Nam 2008; Pirog, Gerrish, and Bullinger 2017). Moreover, the longer an asset threshold change has been in place, the stronger the result, and the more generous the asset threshold increase the larger the level of financial accumulation, on the condition that they have a change in assets greater than zero (Nam 2008). These results hold when cumulative policy changes across TANF and other companion programs such as the Supplement Nutrition Assistance Program[3] and Individual Development Accounts[4] are considered (McKernan, Ratcliffe, and Nam 2010). However, it is still an open question as to whether and how a change in asset thresholds affects re-entry into social assistance.

Collectively the literature suggests that asset thresholds appear to have no impact on caseloads but do improve the financial base of recipient households; however, there is limited evidence related to whether there is any effect on entries, exits, or re-entries to social assistance. Further, there is reason to believe that these findings from the TANF program are not generalizable to Canadian social assistance programs. This is because TANF has peculiar features. In particular, TANF is time limited— a family can collect TANF for a maximum of two years at a time for a total of five years over their entire lifetime. These time limits likely impact the incentives of potential recipients to enter and exit TANF.

Given the widespread use of asset tests in social assistance programs in Canada it is clear that, from a public policy standpoint, more evidence and understanding is needed of the policing, motivating, and amelioration effects of asset thresholds. We contribute to this knowledge by paying particular attention to disaggregating the effects of asset tests on social assistance dynamics and clearly distinguish between new entries, re-entries, and exits in an attempt to more closely examine the effects of asset limits.

This paper is structured as follows. In section 2, we provide the background that informs the empirical methods. We discuss B.C.'s IA program, its history, and the policy change in October 2012 that increased the asset thresholds. We also discuss the data we use and the general research design. The next three sections address the specific empirical model, descriptive statistics and regression results for new entries (Section 3), exits (Section 4) and re-entry (Section 5). Finally, in Section 6, we discuss the results and limitations, and conclude.

2. Background

B.C.'s Income Assistance Program

[3] SNAP is a food-based safety net program and was formerly known as food stamps (Administration for Children and Families 2016). Asset limits for SNAP are set by the federal government that can be relaxed or eliminated by each state. More than half of the US states have dropped asset limits associated with SNAP eligibility (Administration for Children and Families 2016, 25-26).

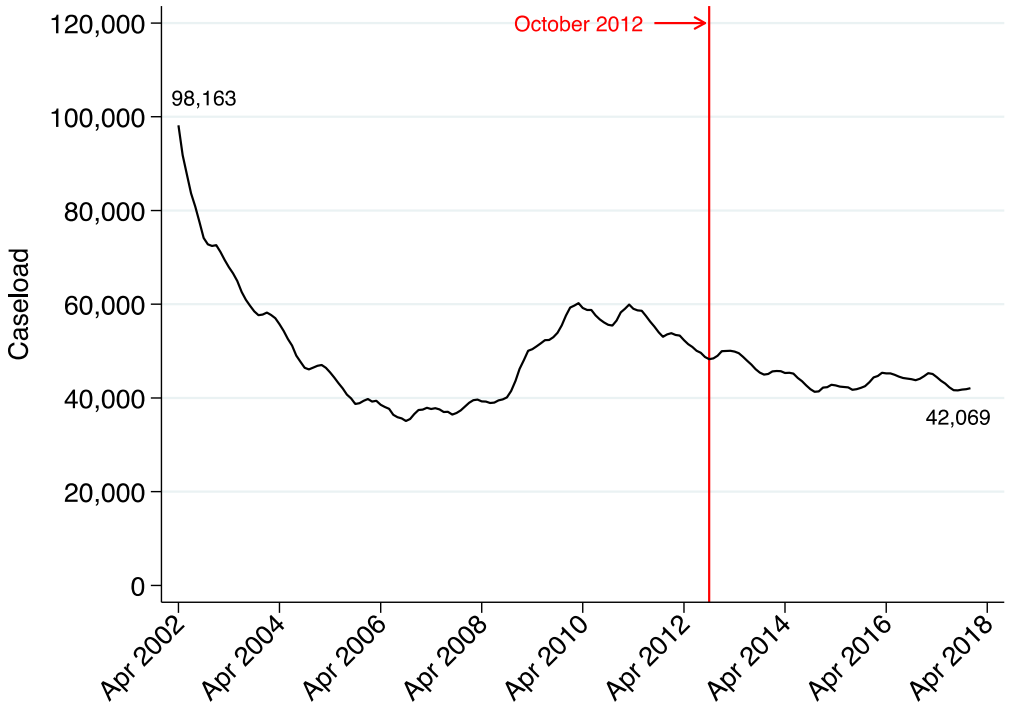
[4] An IDA is a type of savings account designed to help low-income individuals build financial assets. In some states, those on TANF can get matching contributions to their IDA from the state.

The provincial social assistance program in B.C. is called Income Assistance (IA). It provides a monthly cash transfer and other supports (as needed) to persons and families who have no or very little other sources of income to help them cover their basic needs. IA is comprised of two major streams: Disability Assistance (DA) and Temporary Assistance (TA). DA provides a monthly cash transfer and supports for persons who have a designated disability and is considered to be a long-term income support program. TA provides a (lower) monthly cash transfer and supports for persons who do not have a disability designation (Province of British Columbia n.d.). The TA stream is the stream that most people would associate with as a typical 'welfare' or 'funder of last resort' style program and is the program we focus on to examine the effect of asset thresholds.

The IA program has been through several changes since its inception (See Green et al. 2020 for a history of program changes). The biggest change to the program occurred in April 2002 when the new BC Employment and Assistance Act (SBC 2002, c. 40; BCEA Act) replaced the BC Benefits Act (RSBC 1996, c. 27). Under the BCEA Act, new stringent eligibility and access conditions were introduced, significantly increasing the administrative burden for applicants and recipients and making many persons ineligible for IA who would previously have been eligible for IA. In particular, after April 2002 those no longer eligible for IA included students, persons waiting for Employment Insurance (EI), and persons receiving TA who found employment. Furthermore, a new rule stipulated that, to be eligible, applicants must demonstrate they have been financially independent for two consecutive years although there were exceptions (Wallace, Klein, and Reitsma-Street 2006). As a result, persons accessing IA after April 2002 were very different than persons accessing IA before April 2002 (Green et al. 2020). Due to the change in the composition of persons applying to and receiving TA, we restrict our analysis to looking at TA recipients beginning in April 2002, after the BCEA Act was brought in.

With these changes to IA in mind, Figure 1 plots the monthly TA caseloads beginning in April 2002 through to December 2017. From Figure 1, there is a steep decline in the TA caseload from April 2002 until December 2006, likely in large part due to the April 2002 changes. The TA caseload then increases over the 2008 recession, after which it flattens out then declines before levelling out again by December 2017.

Figure 1: *BC Temporary Assistance Monthly Caseload, April 2002 – December 2017*



Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).

Aside from the 2002 change itself, one significant change that has occurred since April 2002 is the change in the asset test, summarized in Table 1. As of April 2002, a TA single adult applicant or recipient could have a maximum of $1,500 worth of non-exempted assets. A TA applicant or recipient with a spouse/partner and/or dependent children could have up to $2,500 in non-exempted assets. For all family types receiving TA, one vehicle with equity less than $5,000 was exempted from total assets. As of October 2012, these asset limits for TA applicants and recipients increased to $2,000 for single adults and $4,000 for all other family types. Further, the vehicle asset exemption increased from $5,000 to $10,000.

Data

To examine the effect of the change in social assistance asset thresholds on new entries, exits, and re-entries we use data provided by the Ministry of Social Development and Poverty Reduction (BC Employment and Assistance (BCEA) V01 2019). This data is recipient-level monthly data. For each recipient of social assistance, we observe basic demographics such as the composition of their family unit, sex, and age, and what social assistance stream (e.g., TA or DA) they are in.

Table 1: *Asset limits for applicants and recipients to Temporary Assistance, April 2002 – December 2017*

		Temporary Assistance	
		Single Adult	**Single Parents, Couples with or without children**
As of April 2002	Non-exempt asset threshold	Recipients: $1,500 Applicants: $1,500 *or* cash assets = TA payment + $150	Recipients: $2,500 Applicants: $2,500 *or* cash assets = TA payment + $250
	Vehicle (exempt)	One vehicle not exceeding $5,000 in equity	One vehicle not exceeding $5,000 in equity
	Exempt assets (not all are included here)	Place of residence Child tax benefit/Universal Child Care Benefit (as of July 10, 2006) GST/HST credit Sales tax credit Working Income Tax Credit (as of March 17, 2008)	
As of October 2012	Non-exempt asset threshold	$2,000	$4,000
	Vehicle (exempt)	One vehicle not exceeding $10,000 in equity	One vehicle not exceeding $10,000 in equity
	Exempt assets (not all are included here)	All the above plus: ▪ Tax returns ▪ Inclusion of new B.C. programs since introduced such as the B.C. Family Bonus, and MCFD's Family Support Services	

The full dataset spans from March 1989 until December 2017. However, we only use the data starting in April 2002. There were significant changes to the program on that date, rendering the recipients of social assistance prior to this change very different from those following this change (as discussed above). After left-censoring the data to begin in April 2002 and using only TA recipients, we observe 305,881 recipients of TA, representing 533,549 episodes on TA for a total of 7,534,832 recipient-episode-time observations.

General Research Design

To examine how increasing asset thresholds affects social assistance entries and exits, we use the increases to B.C.'s TA asset thresholds in October 2012 and use a before-after quasi-experimental empirical design. Because our data is recipient-level, it allows us to take a novel approach to looking at the effect of asset thresholds—we can examine entry, exit, and re-entry separately because we can identify when a client enters TA, when they leave, and if and when they re-enter the program. However, there are also drawbacks to the data. Because we do not observe persons when they are not receiving TA, and because the asset threshold change in October 2012 was for all applicants and recipients of IA, there is no control group available that would allow us to examine causality using a model such as a difference-in-difference regression. It could be argued that we could use similar provincial social assistance data from another province and designate that province as our control group. However, recipient-level data, such as we have access to in B.C., is not generally available and, more importantly, all social assistance programs across the jurisdictions are very different in terms of eligibility and in terms of changes to the programs over time, many of which are not well documented publicly. As such, it is unlikely that the parallel

trends assumptions would be satisfied, and it is unlikely that any observed changes over time are due solely to the intervention being studied.

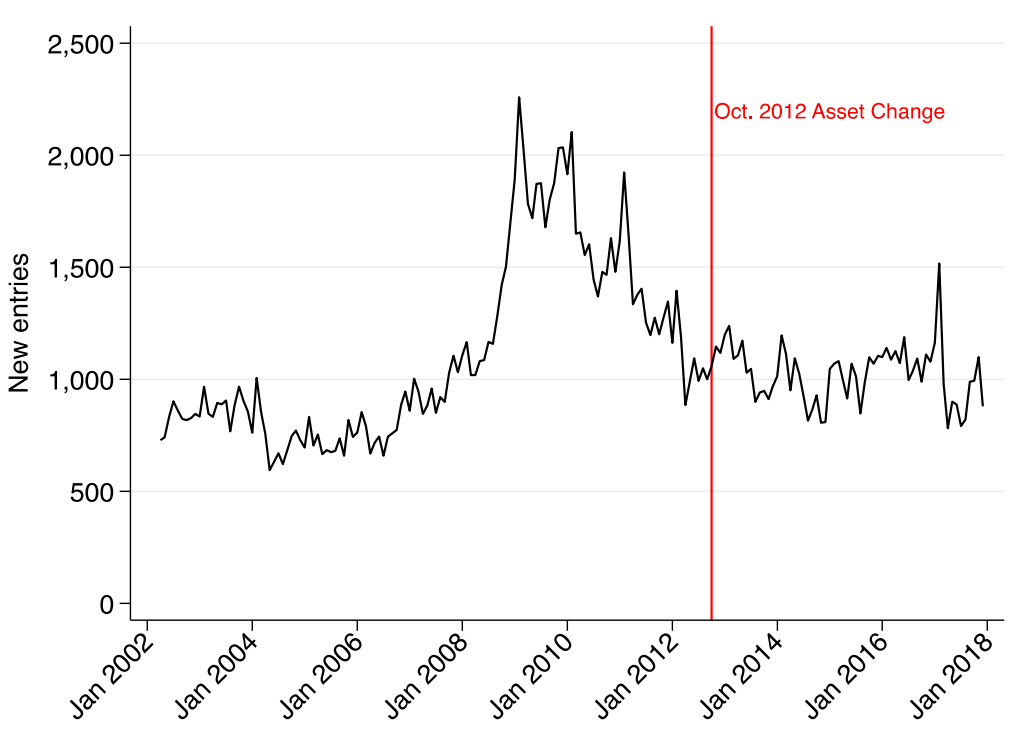
We are interested in testing the three different hypotheses about asset tests that we set out above. That they either service as a policing function, a motivation function, or an amelioration function. Each hypothesis requires a different empirical approach due to the data that is available. We go through each in turn next.

3. The Policing Function of Asset Thresholds: New Entries

New Entries: Descriptive Statistics

In considering the empirical method for each hypothesis, we begin by looking at the descriptive statistics and the available data. Figure 2 shows new entries into TA adjusted for the number of days in a month. Visually, there does not appear to be a surge of new entries into TA following the October 2012 increase in the asset threshold. However, the level of new entries is higher in 2012 – 2017 compared to 2002 – 2006 (before the surge in new entries due to the recession). This may be due to differing economic or labour market conditions, e.g., lower employment rates in 2012 – 2017 compared to 2002 – 2006. We control for these effects in the empirical analysis.

Figure 2:
New Entries, Temporary Assistance, April 2002 - December 2017



Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).

New Entries: Empirical Model

To look at the effect of asset thresholds on policing of entries into TA, we look at how asset thresholds affected new entries into TA. We cannot use the panel structure of the data as we only observe recipients of TA, not potential recipients. Thus, we aggregate new entries into TA in a month (adjusted for number of days in a month) and use an interrupted time series (ITS) approach (Bernal, Cummins, and Gasparrini 2017; Linden 2018).[5] ITS is a quasi-experimental design that is often used when a large-scale intervention is implemented and there is no control group. The general idea behind this model is, using pre-intervention data, a counterfactual is calculated for post-intervention. The actual data is then compared to the counterfactual to measure the effect of an intervention.

We estimate a piecewise linear regression, shown in equation (1), within the ITS framework.

$$Y_t = \beta_0 + \beta_1 T_t + \beta_2 A_t + \beta_3 T_t A_t + BX_t + \in_t \quad (1)$$

The dependent variable (Y_t) is the number of new entries into TA in month t, adjusted for the number of days in a month, A_t is an indicator variable that takes the value of zero before the increase in the asset threshold and one thereafter. X_t is a vector of time-varying province-level covariates that could potentially affect new entries. Effects we control for include: the employment rate, unemployment duration, monthly retail sales, monthly wholesale sales, new housing starts and the 2008 recession (that we set to take a value of one from October 2008 to August 2009, and zero otherwise).[6] We also control for changes to the benefit levels of TA (April 2007 and October 2017) and for when a time limit was in place (April 2002 to March 2004). Within this set-up, β_2 represents the level change in the number of new entries and β_3 represents the change in the rate of new entries over time following the increase in the asset threshold.

Equation (1) is run using both OLS and ARIMA. For the standard errors in the OLS model, to account for autocorrelation in the error term, we use a Newey-West standard error with lag k where the value for k is determined using the Cumby-Huizinga general test for autocorrelation. That is, $\in_t = \rho \in_{t-k} + \psi_t$. We conduct the test for lags 1 to 12, and use the lag with the smallest p-value as k. In the ARIMA model, we follow the Box-Jenkins methodology.

New Entries: Results

Table 2 shows the regression results estimating equation (1). For the segmented regression model, the lag of new entries was included as an independent variable in order to correct for autocorrelation in the residuals. In the ARIMA model, to make TA new entries normal and stationary, the seasonal-differenced first-difference of the log of new entries into TA was used. Thus, the interpretation of the coefficients for the segmented regression and ARIMA model are not the same.

[5] Dependent on the literature, this approach is also called "intervention analysis" (in the statistics literature) and an event study (in the financial literature). "Interrupted time series" is most often used in the health and policy literature.
[6] Figures for these controls are included in the Appendix.

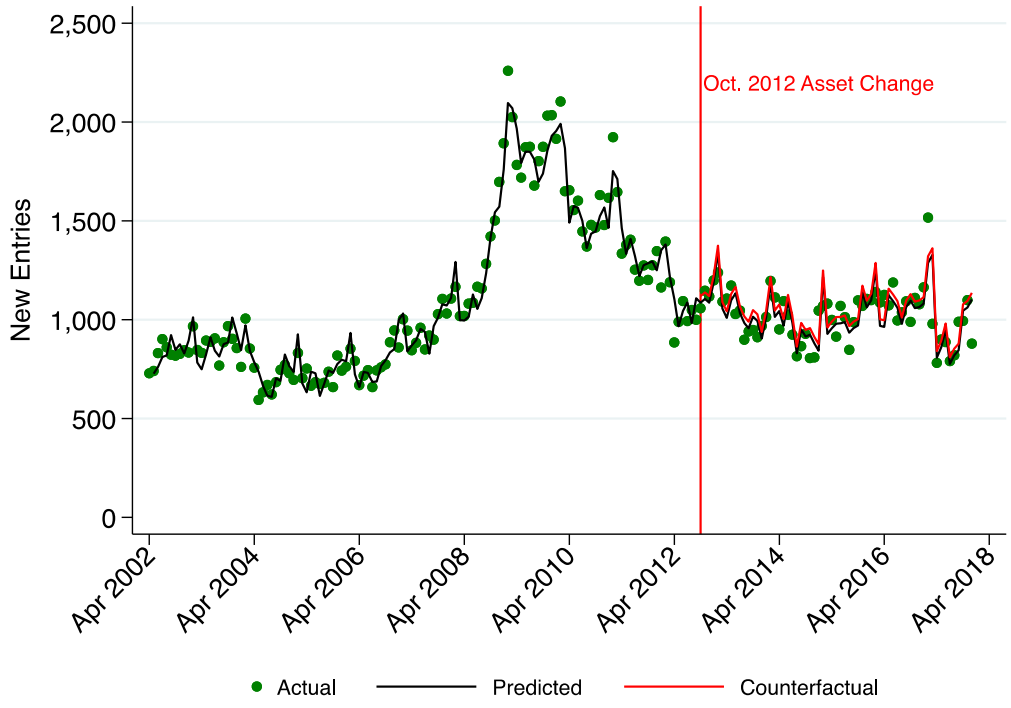
Table 2
TA New Entry Regression Results

	OLS with Newey-West Errors, April 2002-December 2017, no controls (1)	ARIMA Model, April 2002-December 2017, no controls (2)	OLS with Newey-West Errors, April 2002-December 2017, controls (3)	ARIMA Model, April 2002-December 2017, controls (4)
Time Trend (T_t)	0.33 (0.29)	-0.00029 (0.000025)	-0.29 (0.62)	-0.00015 (0.00031)
Policy Change (A_t)	-23.71 (25.35)	0.011 (0.012)	-32.57 (32.73)	0.029 (0.023)
Interaction ($T_t A_t$)	-0.58 (0.44)	-0.00020 (0.00029)	-0.68 (0.75)	-0.00029 (0.0005)
Lag new entries	0.94*** (0.033)	--	0.87*** (0.045)	--
Controls	No	No	Yes	Yes
Monthly Dummies	Yes	No	Yes	No
N	188	176	188	176

Notes: for the ARIMA models, the log of new entries was first taken, then the log was differenced and seasonally differenced for stationarity and normality.

***p<0.001, **p<0.005, *p<0.01

Figure 3
New Entries Regression Estimates: Predicted and Counterfactual Comparison



From Table 2, we see that regardless of the model used, the change in the asset threshold in October 2012 did not have a significant effect on new entries into TA, either immediately or over time. In the OLS model with controls (column 3), the level change in new entries decreased by 32 new entries and the slope, which already exhibited a downward time trend, decreased by an additional 0.7 new entries per month following the change but neither were statistically significant.

Figure 3 provides a visualization of these results and compares the actual number of monthly TA new entries (green dots) to the predicted number of monthly TA new entries (black line) as predicted by the OLS model with controls (column 3 of Table 5). Finally, the red line plots the counterfactual—the predicted number of monthly TA new entries in the absence of the October 2012 change in the asset threshold. From Figure 3, we see that the predicted model and the counterfactual model are not significantly different.

4. The Motivating Function of Asset Thresholds: Exits

Exits: Descriptive Statistics

To examine the motivating function of asset thresholds —whether a lower asset threshold motivates social assistance recipients to leave social assistance—we next look at exits out of TA. From April 2002 to December 2017, there were 493,622 exits out of TA. Table 3 provides some descriptive statistics related to exits and suggests that monthly exits out of TA declined after the increase in the asset threshold: the probability of exit before the change in asset thresholds was 7.22%. After the asset threshold increased, the probability of exit dropped to 5.18%.

Table 3:

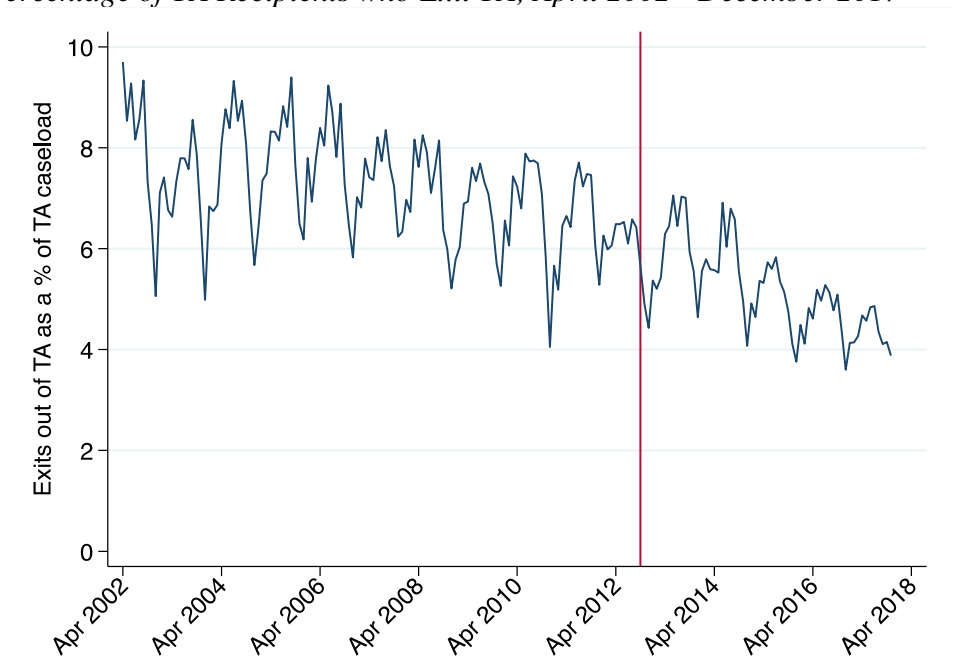
Summary Statistics, Exit out of TA, April 2002 - December 2017

	Total (Apr. 2002 – Dec. 2017)	Before Asset Threshold Increase (Apr. 2002 – Sept. 2012)	After Asset Threshold Increase (Oct. 2012 – Dec. 2017)
Mean number of monthly recipients	39,867 (9,544)	40,842 (11,449)	37,884 (2,167)
Mean number of monthly exits	2,625 (993)	2,954 (1,048)	1,958 (317)
Mean probability of exit monthly	6.55% (1.39)	7.22% (1.07)	5.18% (0.87)

Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019.
Notes: Number in brackets is the standard deviation.

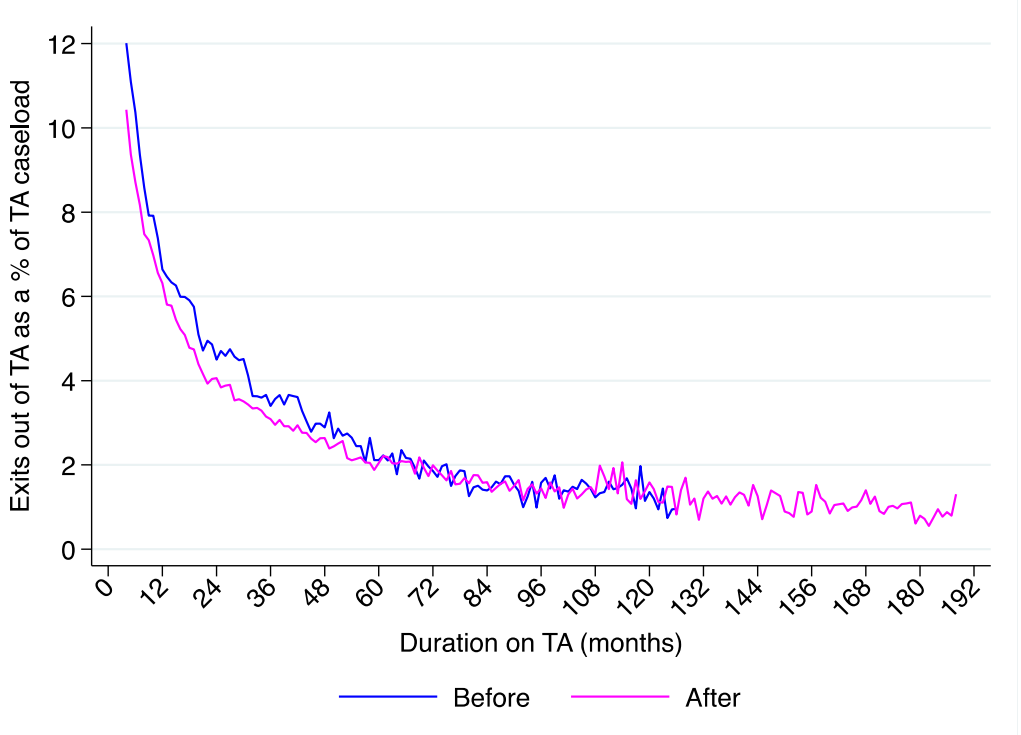
Figure 4 plots the percentage of TA recipients who exit TA from April 2002 to December 2017. The red vertical line is October 2012, when the asset threshold increased. Visually from Figure 4, after the policy change there is an immediate jump up in the probability of exit followed by a steeper rate of decline in the probability of exit.

Figure 4: *Percentage of TA Recipients who Exit TA, April 2002 - December 2017*



Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).

Figure 5: *Monthly Percentage of TA Recipients who Exit TA by Episode Duration and Before-After Asset Threshold Increase, April 2002 - December 2017*



Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).

Figure 5 plots the percentage of TA recipients who exit TA by their duration of an on-TA episode. The blue line shows the exit rate before the increase in the asset threshold. The pink line shows the exit rate after the change in the asset threshold. Figure 5 shows that the asset threshold increase affected those on TA for different durations differently. The longer a person is on TA, the less likely they are to exit TA. For those on TA for five years or less, the increase in the asset threshold is associated with a decrease in the probability of exit. However, for those persons on TA for more than five years, the increase in the asset threshold does not appear to have affected their probability of exit. It appears that duration on TA matters for probability of exit thus we integrate duration into our empirical approach.

Exits: Empirical Strategy

For the exit model, we use duration analysis and ask how does the change in asset thresholds affect duration on social assistance, while taking into account personal attributes and contextual characteristics that also affect duration? Specifically, we use a discrete-time recurrent hazard model. Such models predict the probability that a social assistance "spell" will end conditional on the length of spell. For this analysis, we make use of recipient-level information, such as household characteristics, and history of accessing social assistance.

In the discrete-time recurrent hazard approach, the hazard function is defined as:

$$p_{tij} = PR\left(y_{tij} = 1 \,\middle|\, y_{t'ij} = 0 \; for \; t' < t\right) \tag{2}$$

where p_{tij} is the conditional probability that an exit from TA occurs in month t of episode i for person j given that individual has not yet exited TA, where individual j becomes "at risk" of exit as soon as they begin to receive TA. y_{tij} is a binary indicator equal to one if exit occurs and zero otherwise.

To estimate the hazard function, we use a multilevel random effects discrete-time logit model of the following form:

$$\begin{aligned} logit\left[p_{tij}\right] &= \log\left[\frac{p_{tij}}{1 - p_{tij}}\right] \\ &= \boldsymbol{\alpha}^T \boldsymbol{D}_{tij} + \theta_1 A_{tij} + \theta_2 T_{tij} + \theta_3 T_{tij} A_{tij} + \boldsymbol{\beta}^T \boldsymbol{X}_{ti} + \boldsymbol{\delta}^T \boldsymbol{Z}_{tij} + u_j \end{aligned} \tag{3}$$

In Equation (3), $\boldsymbol{D}_{tij}$ is a vector of time dummies for elapsed duration on TA. A_{tij} is the same as in model (1). T_{tij} is the time since the start of the observation period with T = 0 in April 2002. $\boldsymbol{Z}_{tij}$ is a vector of recipient characteristics and episode characteristics that can be time-varying. Recipient characteristics include dummies for family type (single parent, single women, single men, couple with no children, and couple with children), number of dependent children, and age of main beneficiary. Episode characteristics includes the interactions between the cumulative duration of time spent on IA and a dummy for the episode number. $\boldsymbol{X}_{tij}$ is the same as in model (1). Finally, u_j is the unobserved recipient-specific (time-invariant) risk factor. We include these unobserved factors because it is possible that different social assistance clients have different

(unobserved) susceptibility to experiencing exit or re-entry. We assume $u_j \sim N(0, \sigma_u^2)$ and is common to all episodes.

Our identification strategy is similar to the strategy used for the new entries/policing model: we compare the hazard rate of exit before and after the October 2012 increase in the asset threshold while controlling for any possible household or economic changes that occurred at the same time as the change in the asset threshold.

Exits: Regression Results

Table 4 provides the regression estimates for the exit regression model (specified in Equation (3)). In column (1), the monthly dummies are included with no other controls. Column (2) includes the monthly dummies and household controls. Column (3) includes the full set of controls—both household and economic and labour force controls. As a comparator, a linear probability model using generalized least squares with random effects and the full set of controls is presented in column (4).

Table 4:
TA Exit Regression Results

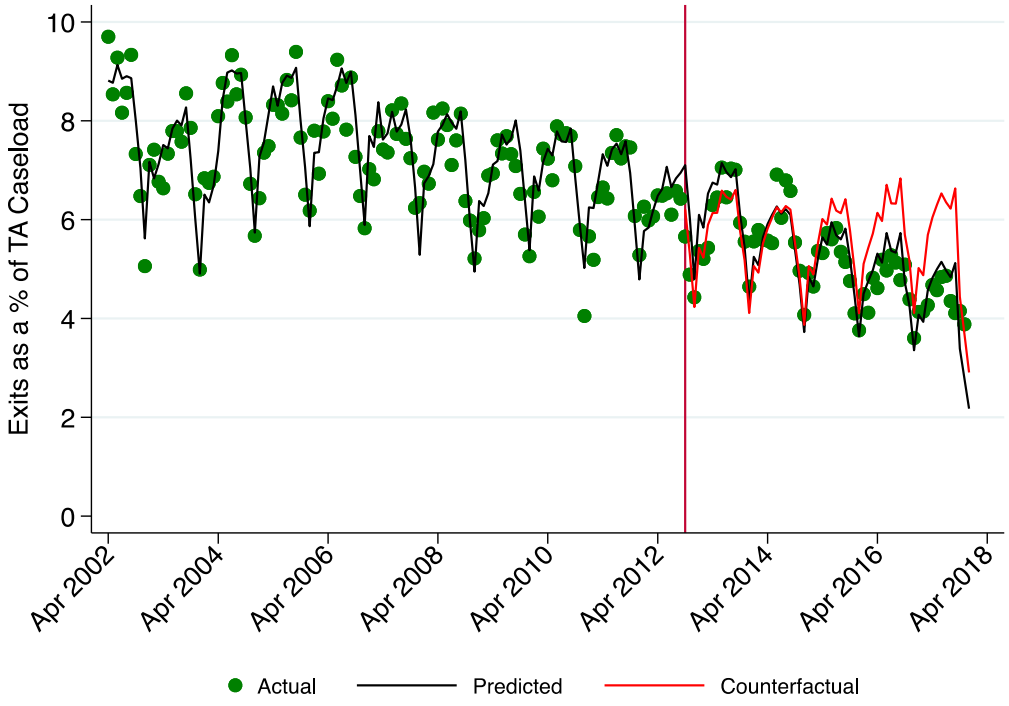
	Multilevel logit model, no controls (1)	Multilevel logit model, household controls (2)	Multilevel logit model, all controls (3)	Linear probability model (GLS), all controls (4)
Time Trend (T_t)	-0.0032*** (0.000048)	-0.0034*** (0.000047)	-0.0040*** (0.00020)	-0.00025*** (0.000012)
Policy Change (A_t)	0.15*** (0.0069)	0.15*** (0.0068)	0.16*** (0.0093)	0.0067*** (0.00053)
Interaction ($T_t A_t$)	-0.0050*** (0.00018)	-0.0053*** (0.00017)	-0.0072*** (0.00036)	-0.00020*** (0.000021)
Recipient-level Random Effect	0.042 (0.0007)	0.021 (0.00062)	0.025 (0.00066)	
Household Controls	No	Yes	Yes	Yes
Economic Controls	No	No	Yes	Yes
Monthly Dummies	Yes	Yes	Yes	Yes
N	7,534,832	7,534,832	7,534,832	7,534,832

Notes: columns (1) – (3) are estimated using Equation (2) and reports coefficient values (not the odds ratio). Column (4) is estimated using GLS. Standard errors are in brackets.
***p<0.001, **p<0.005, *p<0.01

The results in Table 4 confirm what Figure 3 suggested: following the increase in asset thresholds, there is a statistically significant level increase in the probability of exit. However, as time passes, there is a statistically significant decline in the rate of exit the longer the higher asset threshold is in place. All the logit models show relatively the same magnitude of effect. When all controls are included in the model (column 3), the magnitude of the effect of the increase in the asset threshold is the largest. It suggests that in 2017, just over four years after the increase in the asset threshold, there was, on average, 470 less exits per month than had the asset threshold remained at its lower level. That is about 25% less exits per month representing about 1.1% of the average TA caseload in 2017.

To visualize the effect of the increased asset threshold on the probability of exit, Figure 6 plots the actual percentage of exits against exits predicted by the model and the counterfactual, e.g., what the model predicts would occur had the asset threshold increase not occurred. Figure 6 was created using the multilevel logit model with all controls (column (3) in Table 4) and assuming that all recipients have an average unobserved risk factor. From Figure 6, we see that as the predicted probability of exits declines, the gap between the predicted probability of exit and the counterfactual (what the model predicts would have been the probability of exit had the asset threshold not changed) increases: the effect of the increased asset threshold becomes stronger over time.[7]

Figure 6
Exits Regression Estimates: Predicted and Counterfactual Comparison



5. The Self-Sufficiency Function of Asset Thresholds: Re-entries

Re-Entries: Descriptive Statistics

Finally, to examine whether increased asset thresholds reduce re-entry into TA, potentially assisting TA recipients in leaving TA permanently, we examine re-entries into TA. After left-censoring the data to only include those who were TA recipients on or after April 2002, we

[7] To check the effect of the time trend, a number of robustness checks were run and are available in the Appendix. Robustness checks included: including a quadratic trend and running the same linear trend over a shortened time frame (from October 2006 to October 2017 inclusive). The results are similar for all models. When including a quadratic trend, the effect remains statistically significant and the magnitude of the effect declines somewhat.

analyzed 287,315 persons who had had at least one episode on TA on or after April 2002. For these persons, there were 490,311 off-TA episodes for a total of 27,489,347 recipient-episode-time observations. Over this time period, there were 269,356 re-entries into TA. Table 5 reports summary statistics. Note that we drop April and May 2002 and November and December 2017. There are zero re-entries in April and May 2002 due to how the data set was formed: persons had to have had at least one TA episode on or after April 2002 so the earliest they could exit TA was May 2002 meaning there could be no re-entries in April or May 2002. Table 5 suggests that after the asset threshold increase in October 2012, the number of re-entries and the percentage of at-risk persons re-entering TA declined comparative to before the asset threshold increase.

Table 5: *Summary Statistics, Re-entry into TA, June 2002 - October 2017*

	Total (June 2002 – Oct. 2017)	Before Asset Threshold Increase (June 2002 – Sept. 2012)	After Asset Threshold Increase (Oct. 2012 – Oct. 2017)
Mean number of monthly at-risk previous TA recipients	148,591 (52,030)	120,695 (40,200)	205,299 (10,555)
Mean number of monthly re-entries	1,456 (337)	1,504 (382)	1,358 (182)
Mean probability of monthly re-entry	1.14% (0.005)	1.37% (0.0045)	0.67% (0.0011)

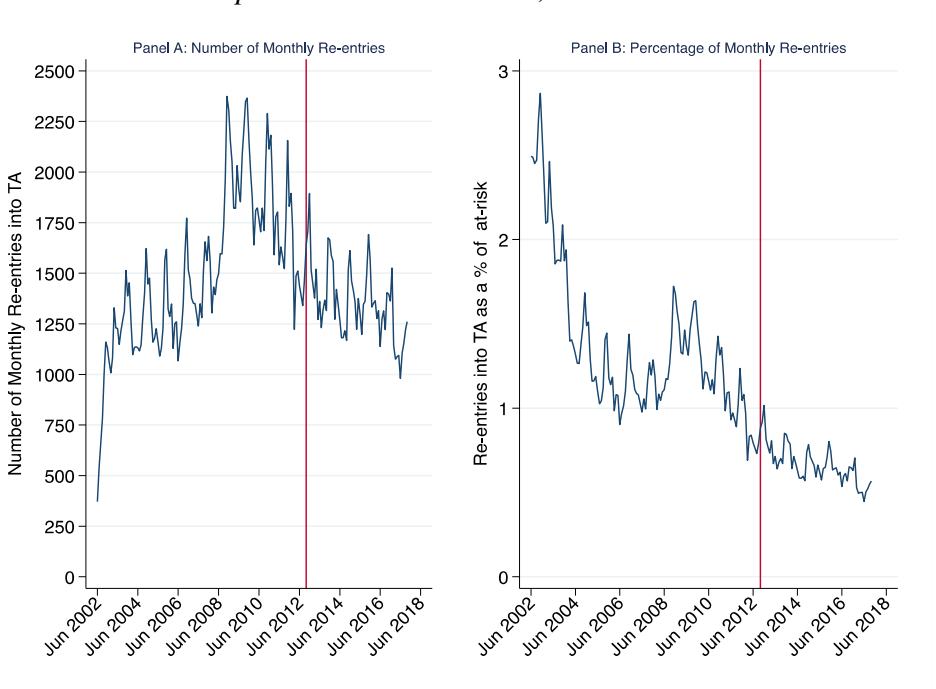
Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).
Notes: Number in brackets is the standard deviation.

Figure 7 Panel A shows the total number of TA re-entries between June 2002 and October 2017. Panel B shows the probability of re-entry into TA, calculated by dividing the monthly number of re-entries by the monthly number of persons who are at-risk of TA re-entry. From Figure 7 Panel A we see that it appears that the number of re-entries declined after the asset threshold increase; however, re-entries were already declining previous to the change. From Panel B, we see that until about 2006, there is a large drop in re-entries. This may be a numerical artifact: there were less persons "at risk" in the early months given how we have defined those "at risk" so the denominator is small, leading to a large probability of re-entry. By 2006, the trend appears to stabilize, with the probability of re-entry jumping up during the 2008/2009 recession, before declining again. After the October 2012 increase in asset threshold, the probability of re-entry appears to flatten. From both Panel A and Panel B, it is not clear whether the increase in the asset threshold had an effect on re-entry.

To examine the effect of duration off TA on re-entry, Figure 8 Panel A plots the probability of re-entry by duration of time (in months) spent off of TA and before-after the policy change (in calendar time). Panel B plots the probability of re-entry by duration of time (in months) spent off of TA and for those who exited TA before-after the policy change, e.g., it separates those who exited TA after the asset threshold increase and thus were exposed to the increased asset threshold while on TA from those not exposed to the increased asset threshold because they exited TA before the policy change. Panel B only looks at the first five years of off-TA duration as persons could have been exposed and "at-risk" for a maximum of 61 months. From Figure 8, we see that the

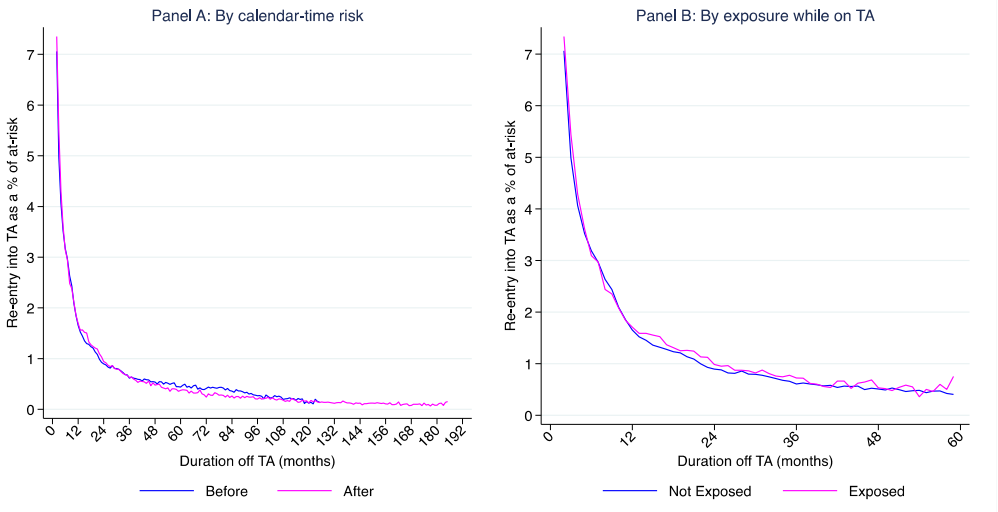
increase in the asset threshold did not appear to have an effect on re-entry into TA regardless of duration spent off-TA.

Figure 7:
Percentage of Previous TA Recipients who Re-enter TA, June 2002 - October 2017



Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).

Figure 8:
Percentage of Previous TA Recipients who Re-enter TA by Episode Duration, June 2002 - October 2017



Source: BC Ministry of Social Development and Poverty Reduction (2018). BC Employment and Assistance (BCEA) V01. Data Innovation program, Province of British Columbia 2019. Data Extract. Approver Year (2019).

Re-entries Empirical Methodology

Although Figure 8 suggests that duration is not as important as in the exits model, we use the same general empirical model as for exits that includes duration nevertheless. The event is re-entry into TA. Persons are "at risk" of re-entry into TA if they exit a previous TA spell on or after April 2002. We then use a discrete-time multilevel recurrent hazard model with random effects to predict the probability that a person who was once on TA but is experiencing an off-TA spell, that spell off TA will end after year t, conditional on the spell having lasted that long in the first place.

The increase in the asset threshold that occurred in October 2012 will have an effect on re-entry through two different avenues. First, re-entries could increase because re-entry requirements are slightly eased (the policing effect). Second, re-entries could decrease for those who had completed a spell on TA under the new asset thresholds because they were able to build a more sufficient asset base to use to weather new shocks. To account for this, we differentiate between the two effects. Our new regression equation is:

$$logit[p_{tij}] = \log\left[\frac{p_{tij}}{1 - p_{tij}}\right] = \boldsymbol{\alpha}^T \boldsymbol{D}_{tij} + \theta_1 A_{tij} + \theta_2 T_{tij} + \theta_3 T_{tij} A_{tij} + \theta_4 EA_{tij} + \theta_5 EA_{tij} * ET_{tij} + \boldsymbol{\beta}^T \boldsymbol{X}_{ti} + \boldsymbol{\delta}^T \boldsymbol{Z}_{tij} + u_j \quad (3)$$

where EA_{tij} is an indicator that takes a value of one if a person at risk of re-entry was exposed to the increased asset thresholds while on TA and zero otherwise. ET_{tij} is the total duration of on-TA time exposed to the higher asset threshold.

Re-entries: Results

Table 6 provides the regression estimates for the multilevel random effects discrete-time logit model (specified in Equation (3)) for re-entries into TA. In column (1), only the monthly dummies are included with no other controls. Column (2) includes the monthly dummies and household controls. Column (3) includes the full set of controls—both household and economic and labour force controls. As a comparator, a linear probability model using generalized last squares with random effects and the full set of controls as used in column (3) is presented in column (4).

From Table 6, we see that the models with no controls and household controls (columns 1 and 2) differ from the model with all controls (column 3). When the economic, labour and TA controls are added in column 3, those controls have large, statistically significant effects.[8] The literature shows that economic, and labour controls help to explain changes in caseloads (Kneebone and White 2009) and thus should be included. Further, based on AIC and BIC, the model with all controls (column 3) performs better. Thus, we use the model with all controls in Column 3 as our preferred model.

When all controls are added in column (3), for all at-risk persons, the increase in the asset threshold was associated with a statistically significant level decrease in the probability of re-entry and a statistically significant increase in the rate of re-entry. There was also a statistically significant level increase in the probability of re-entry for those who were exposed to the increased asset

[8] Regression tables including estimates for all coefficients are included in the appendix.

threshold while receiving TA and a statistically significant decrease in the rate of re-entry for those exposed to the asset level change while on TA.

Table 6:
TA Re-entry Regression Results

	Multilevel logit model, no controls (1)	Multilevel logit model, household controls (2)	Multilevel logit model, all controls (3)	Linear probability model (GLS), all controls (4)
Time Trend (T_t)	0.0035*** (0.000077)	0.003955*** (0.000075)	0.001738*** (0.00029)	-0.00000497 (0.0000030)
Policy Change (A_t)	-0.3675*** (0.0089)	-0.3709*** (0.0088)	-0.1214*** (0.012)	-0.001274*** (0.00010)
Interaction ($T_t A_t$)	-0.004060*** (0.00024)	-0.003764*** (0.00024)	0.001597** (0.00049)	-0.0000598 (0.0000045)
Exposed to Policy Change (EA_t)	0.1087*** (0.011)	0.1234*** (0.010)	0.1027*** (0.01)	-0.003165*** (0.00016)
Exposure to Policy Change*Length of time exposed ($EA_t * ET$)	-0.003977*** (0.00056)	-0.007052*** (0.00055)	-0.007270*** (0.00055)	-0.0001182*** (0.000010)
Recipient-level Random Effect	0.17 (0.0015)	0.095 (0.0014)	0.093 (0.0014)	0.064
Household Controls	No	Yes	Yes	Yes
Economic Controls	No	No	Yes	Yes
Monthly Dummies	Yes	Yes	Yes	Yes
N	27,489,347	27,489,347	27,489,347	27,489,347

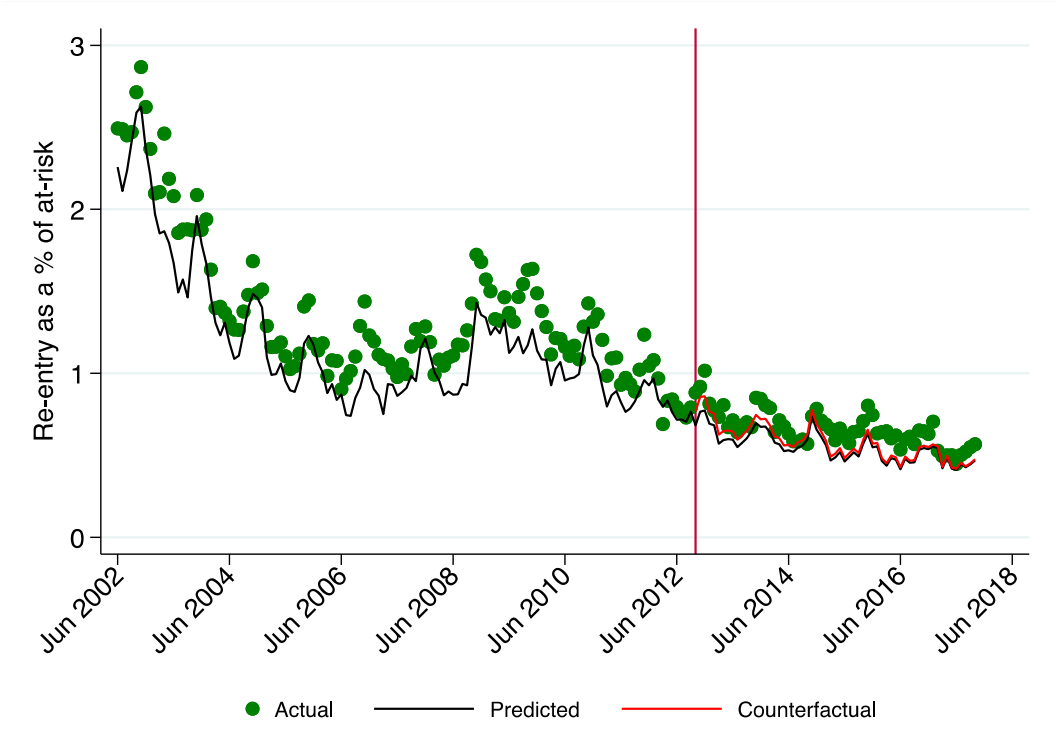
Notes: columns (1) – (3) are estimated using Equation (3) and reports coefficient values (not the odds ratio). Column (4) is estimated using GLS. Standard errors are in brackets.
***p<0.001, **p<0.005, *p<0.01

Although the effects were statistically significant, the magnitude of the effect is small. Using the estimates above from Table 6 column (3) for the re-entry model with all controls included, the models suggest that in 2017, there was an average of 17 more re-entries per month in 2017 than had the asset threshold not been changed—about 0.04% of the total caseload. To visualize the effect of the increased asset threshold on the probability of re-entry, Figure 9 plots the actual percentage of re-entries against re-entries predicted by the model and the counterfactual, e.g., what the model predicts would occur had the asset threshold increase not occurred. Figure 9 was created using the logit model with all controls (column (3) in Table 7) and assuming that all recipients have an average unobserved risk factor. From Figure 9, we observe that there is little to no difference between re-entries predicted by the model and re-entries had the increase in the asset threshold not occurred.

These results suggest that knowledge of the increased asset threshold due to having experienced it may have prompted some re-entry; however, overall, the increase in the asset threshold did not result in a level increase in re-entries. In fact, overall, after the increase in the asset threshold, there was a level decrease in re-entries. Further, although the overall rate of re-entry increased after the increase in the asset threshold, this was mitigated by a decrease in the rate of re-entry for TA recipients who had been exposed to the increased asset threshold while on TA. This suggests that

exposure to the increased asset threshold while on TA may have had some effect on the ability to permanently leave TA.

Figure 9
Re-Entry Regression Estimates: Predicted and Counterfactual Comparison



6. Discussion

The use of asset thresholds as an eligibility criterion for income assistance have been argued for as a policing mechanism to keep wealthy persons from taking advantage of a program and as a motivation mechanism to motivate those on the program to leave and become self-sufficient. Asset tests have also been argued against as they force applicants to spend down their assets and may force recipients to leave the program prematurely. In our examination of these arguments, we exploit an increase in the asset thresholds for TA applicants in B.C. and use recipient-level data to examine the effects.

Using an interrupted time series approach, we find that there was no statistically significant effect on new entrants to TA. This suggests that the asset test may not serve a policing function. The decision of whether or not to enter into the TA program is complicated and asset thresholds are likely not as important as other considerations for entry such as the stigma from accessing welfare.

Using a multilevel logit (duration) model, we next tested the hypothesis that an increase in the asset threshold would result in a decline in the probability of exit from TA: that is, recipients would not be as motivated to leave TA. Our regression results suggest that this is the case: when the asset

threshold increased, the probability of exit from TA declined over time as TA recipients adjusted to the new asset thresholds. By 2017, there were about 25% less exits per month than had the asset threshold not changed; however, these exits are only 1.1% of the total TA caseload.

It is possible that this decline in exits was partially due to a new earnings exemption that was implemented at the same time as the increase in the asset threshold. Prior to October 2012, there was no earnings exemption and TA benefits were clawed back by $1 for every $1 earned. As of October 2012, TA recipients who earned up to of $200/month for single persons and $300/month for families with children did not have their TA benefits clawed back. This earning exemption may have resulted in some TA recipients remaining on TA longer, decreasing the probability of exit. For example, in December 2019, only about 12% of TA cases had any earned income and, of those with earned income, 93% had earnings below the earnings exemption (BC Ministry of Social Development and Poverty Reduction 2021). Prior to October 2012, these TA recipients would have been forced to leave TA. We cannot untangle these effects.[9]

Finally, in order to test whether the increased asset threshold allowed recipients to leave TA permanently, we next tested the hypothesis that an increase in the asset threshold would result in a decline in the probability of re-entry into TA. Overall, the results suggest that on the one hand, asset thresholds do not police entry into TA, re-enforcing the results seen with new entries, but that knowledge of more generous eligibility requirements can increase entry, and they suggest that for those exposed to higher asset limits while receiving TA, they may be able to leave TA permanently. On the other hand, the results suggest that all these effects are of a small magnitude. This result is not surprising as there are other barriers to entry, such as stigma, that likely have a larger effect on the choice to re-enter TA and it is highly unlikely that a TA recipient can save while on TA even with a higher asset threshold given that TA benefits are very low.

In summary, from our models we conclude that an increase in the asset threshold has no effects on new entries and re-entries suggesting that asset thresholds do little to police entry into income assistance and they have little effect on helping recipients permanently leave social assistance. Further, we conclude that an increase in asset thresholds has a moderate effect on exits suggesting that asset thresholds may motivate exit; however, because of an earnings exemption that was implemented at the same time as the increase in the asset threshold, it is difficult to untangle these effects. Ultimately, these findings suggest that asset tests may have very little effect as a policy tool and that asset threshold could be relaxed more without seeing a large effect on caseloads. This would ease the burden of TA applicants and recipients who are some of the most vulnerable people in society and who already face extreme pressure due to their financial situation.

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[9] Note that data on earnings of TA recipients is not available in the recipient-level data we were granted access to.

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