

# **Simplifying the Application Process for Institutional Financial Aid: A Case Study at Brock University**

Prepared by the Canadian Education Project of the Higher Education Strategy Associates  
for the Higher Education Quality Council of Ontario



An agency of the Government of Ontario

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# Introduction

## Project Background

In 2008, the Higher Education Quality Council of Ontario (HEQCO) issued an open Request for Proposals (RFP) to Ontario colleges and universities that would allow them to evaluate interventions that already existed at those institutions and that were designed to promote student success in various ways. Brock University was involved in a total of four research projects that were approved for funding at that time, including this project. This research project also has the distinction of being the only one in the RFP which involved a re-examination of institutional financial aid policies.

## Project Purpose

Institutional financial aid applications ask a wide range of questions dealing with both the personal and financial history of the student and his/her family. This process can take a significant amount of the student's time, and may even intimidate some. Moreover, the level of financial detail required in the application may be a deterrent to students who might be either embarrassed to disclose family details, or uncomfortable asking their parents about the financial situation of their family.

It is believed that the complex and potentially discouraging application process that exists at many postsecondary institutions (and many government financial aid programs) can be simplified by including fewer fields in the application for funding. This would benefit both student applicants and institutional administrators, and could likely be done without significantly altering the output that would have been generated using the original full application.

The purpose of this project is to compare two approaches to calculating student financial assessed need for the purposes of determining eligibility for the Brock University Entering Student Bursary. The research question being addressed in this project is whether a simplified approach to calculating assessed need would lead to similar outcomes in terms of identifying eligibility for the Entering Student Bursary as the original application process that had been in place for years at Brock University.

## Brock University Entering Student Bursary

Brock University provides \$1,250 to entering students who demonstrate financial need. The Brock University Entering Student Bursary is only available to first year students, and only during their first year of study. To be eligible, applicants must meet Ontario residency requirements and must apply for full-time undergraduate studies.

The Brock University Entering Student Bursary is promoted to prospective students in written and on-line material as well as on the undergraduate recruitment web site. In addition, reminder emails are sent as the deadline to apply for the bursary approaches to encourage prospective students to apply for the various scholarships and bursaries that Brock offers. The application

and assessment process occurs in March, and if the student decides to attend Brock University the following year, the bursary is credited towards their tuition.

Table 1 shows a breakdown of first year admission applications and entrance bursary applications over the last three years. It also shows the per cent of entrance bursary applications that were approved, and the per cent of bursary applicants who registered, with and without the bursary. Between 55 per cent and 58 per cent of applicants who had their bursary approved registered at Brock. Of those who did not have their bursary approved, between 54 per cent and 61 per cent registered at Brock.

**Table 1 – Comparison of Entrance Bursary Application and Registration Status**

Applicant Status	Entry Year		
	2009	2010	2011*
Year 1 admission applications	16,325	16,041	15,626
Entrance bursary applications	848	1,056	1,297
Per cent of 1 <sup>st</sup> year admission applicants who applied for bursary	5%	7%	8%
Entrance bursary approved	613	711	855
Entrance bursary per cent approved	72%	67%	66%
Total year 1 registrants	2,902	3,059	3,134
Registrants who applied for bursary	500	577	731
Per cent of registrants who applied for bursary	17%	19%	23%
Bursary applicants approved who registered	357	390	470
Per cent of bursary applicants approved who registered	58%	55%	55%
Bursary applicants not approved who registered	143	187	261
Per cent of bursary applicants not approved who registered	61%	54%	59%

\* preliminary, unofficial data for admission applications and registration

The current application contains 25 questions, which are similar to those on the provincial loan application. Brock staff use the information in the application, together with various assessment tables, to determine need.

To apply, the student completes an online Student Profile that requests a range of information including the following (see Appendix A for the actual questions contained in the on-line application):

- Personal income
- Family income
- Spousal income if married
- Other resources

- Number of siblings and number in postsecondary education (PSE)
- Number of dependent children
- Whether the student has a parent working at Brock (if so the tuition expense is zero)

Assessed need is calculated on a similar basis as it would be for the Ontario Student Assistance Program (OSAP):

- Living expenses based on whether the student is living at home or away, and whether or not the student has dependents
- Tuition and books are calculated based on the percentage of a full course load
- Parental contributions are based on family income, family size and the number of children in PSE
- Spousal contributions are based on income and the number of dependent children

### The Five Question Short-Form Calculator

Prior to the launch of this study, CanEd had already developed a simplified calculator to estimate loan and grant funding from the Canada Students Loan Program and provincial student loans programs. One version of this simplified calculator has also been made available on the GlobeCampus website.

Because the purpose of the study is to determine whether a few questions are sufficient to estimate need for the purposes of bursary eligibility, it was important that the simplified calculator not differ from the Brock calculator in any way other than the total number of questions asked. For that reason, the CanEd calculator had to be modified to estimate need for bursary eligibility rather than assessed need as defined by the Canada and provincial student loans programs. Both the revised version and the Brock calculator employ the same method of estimating need, at least where feasible given the differences in the information each calculator uses.

This short-form calculator asks only five questions and is designed for use by dependent students in their last year of high school (and makes assumptions appropriate to their situation). The calculator uses the following information to generate student financial assistance funding estimates:

- Whether the student will be living with his/her parents or away
- Number of siblings in PSE
- Total family size
- Total parental income
- Other resources

One of the changes made from the original CanEd calculator was how parental income was measured. The original CanEd calculator asks about each parent's income separately. Since Brock's bursary application only asks for total parental income, the short-form calculator had to be modified to use total parental income and to make the same assumptions as Brock as to how

to split the income between parents. This may not give the same results as the CanEd calculator would if each individual parental income was known.

Need is calculated the same way in each calculator: total resources minus total expenses. The difference lies in what goes into the calculation of total resources and total expenses. These differences are described in the following table.

**Table 2 – Summary of Differences in Expense and Resource Estimates between Calculators**

	<b>Brock’s Bursary Calculator</b>	<b>Short-Form Calculator</b>
<b>Estimating Expenses:</b>		
Estimating living expenses	Uses information on marital status, number of dependents, whether the student is considered to be independent or dependent of his/her family, and whether the student is living at home or away from home.	Only uses information on whether the student lives at home or away from home. As such, the short-form calculator produces only two living expenses estimates: <ul style="list-style-type: none"> <li>- For all students living at home: uses Brock’s living expenses estimate for <i>Single Dependent Students Living at Home</i>.</li> <li>- For all students living away from home: uses Brock’s living expenses estimate for <i>Single Dependent Students Living Away From Home</i>.</li> </ul>
Estimating tuition	Total tuition is estimated based on declared course load and whether the student is domestic or international, with a health fee charged to all students taking three or more courses.	Estimated at \$5,330.15 for all, plus \$131 in health fees – this is the Brock calculator’s amount for a student taking a full course load of 5 credits, paying domestic tuition.

	<b>Brock's Bursary Calculator</b>	<b>Short-Form Calculator</b>
Estimating book expenses	Calculated at \$300 per course.	Estimated at \$1,500 for all – equivalent to \$300 per course and a full course load of five courses.
<b>Estimating Revenue:</b> Estimating contributions from student's pre-study period income	For most students, Brock assumes a minimum contribution of \$1,526, plus an amount based on a percentage of reported pre-study period income minus taxes and a living allowance. For certain students (i.e., independent students) the minimum contribution is lower.	Assumes a minimum contribution of \$1,526 – Brock's minimum contribution for a dependent student who lived at home in the pre-study period.
Estimating contributions from student's study period income	Expects a contribution from study period income. Study period income is reduced by estimated taxes and a living allowance of \$1,700; the student is expected to contribute 80 per cent of the remainder.	No contribution expected – assumes that study period income will be low enough that the exemption Brock grants in its need assessment will reduce the contribution from study period income to zero.
Calculation of expected parental contribution	Same as in the short-form, except that no contribution is expected for independent students.	Same as the Brock calculator, but contributions are calculated in the same manner for all students (independent students are not identified)
Spousal contribution	A spousal contribution is assessed for students with spouses who are not themselves full-time students.	No spousal contribution.

The Brock University Entering Student Bursary has a provincial residency requirement for eligibility that the CanEd calculator does not include. We have assumed that only those applicants who meet the residency requirement were included in the data provided by Brock. Obviously if this simplified version were to be implemented a screening question would need to be added to ensure amounts are not estimated for applicants who are not eligible.

## Project Methodology

In January and February of 2010, Brock University collected applications for their bursary and then administered their calculator to estimate each applicant's financial need. They provided

CanEd with data in early March. The file contained information for 622 applicants with the following fields:

- Student identifier
- At home or away status
- Parental income range
- Spouse income range
- Family size
- Number of siblings in PSE
- Program (if known)
- Pre-study resources
- Study period resources
- Scholarships and tuition waivers
- Other resources
- Total resources
- Brock's expense estimates
- Brock's estimated need

The file also indicated whether or not the applicant would be awarded a Brock University Entering Student Bursary if he/she decides to attend the university. Generally, applicants with estimated need of at least \$1,250 were offered a bursary. Of the 622 applicants in 2010, 494 (79 per cent) were eligible for a bursary.

CanEd used the data to estimate need using the short-form calculator described in the previous section. Note that there were 16 cases that had to be excluded from the analysis reported in this paper because the data could not be used to estimate need for various reasons:

- Three had a family size of one, but also had parental income listed (since family size includes the applicant, the family must include at least one parent and one student) so a moderate standard of living could not be calculated in these cases.
- One had entered a *negative number* for their scholarship amount. This resulted in a *negative* amount for total resources.
- Six left their parental income field blank. It is unknown whether this represented an input error in the data; as such, the research team has erred on the side of caution and excluded these cases from consideration.
- Six cases were found to have duplicate ID numbers (i.e., three of the unique identifiers appeared twice). For two of the identifiers, the data that had been collected was different across entries. As it was unclear how duplicate entries would have been possible and whether they would have led to any problems with data recording, these six cases were discarded.

A series of analyses were then conducted to compare the two models in terms of estimated need and the bursary decisions that would be made based on the need estimates. Analyses of the factors that may explain the reasons for the differences between the two models were also conducted.

## Calculator Comparison Analysis

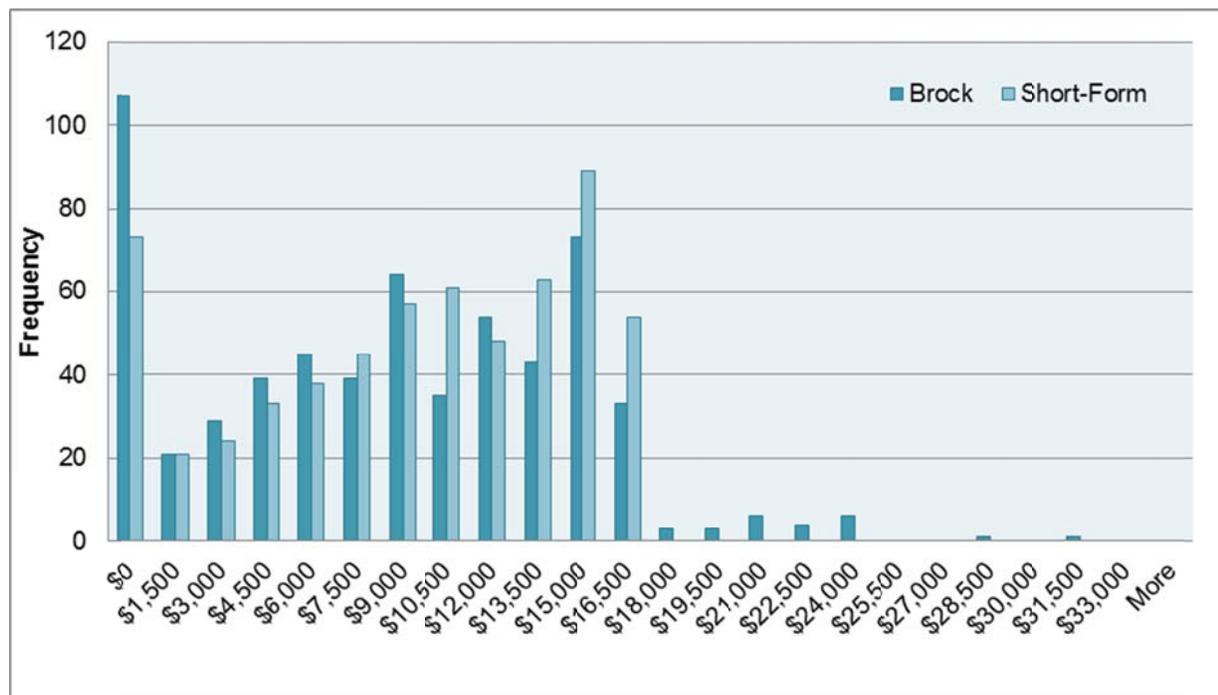
The results from the short-form calculator were compared with the results calculated by Brock's more detailed application method with respect to both estimating need and bursary eligibility. Analyses were then conducted to determine the causes of the discrepancies between the two approaches.

### Comparison of Need Estimates

Brock's calculator results in an average estimated need of \$7,965.17, while the average estimated need based on the short-form calculator was \$8,550.42. On average, the short-form calculator estimates \$585.25 in additional need. The short-form calculator has a lower standard deviation (\$5,103.46 vs. \$5,889.10), which means its need estimates vary somewhat less than Brock's calculator.

Figure 1 shows the distribution of estimated need from the two calculators. The Brock calculator estimates more applicants with zero need than does the short-form calculator, but on the other hand it produces higher estimates of need than are possible with the short-form calculator.

**Figure 1 – Estimate of Need by Both Calculators**



Note: the labels for the need estimate categories give the upper limit of the category; the first bar, labelled \$0 is exactly \$0 need; the second bar, labelled \$1,500, is the category of need above 0 up to \$1,500; and so on.

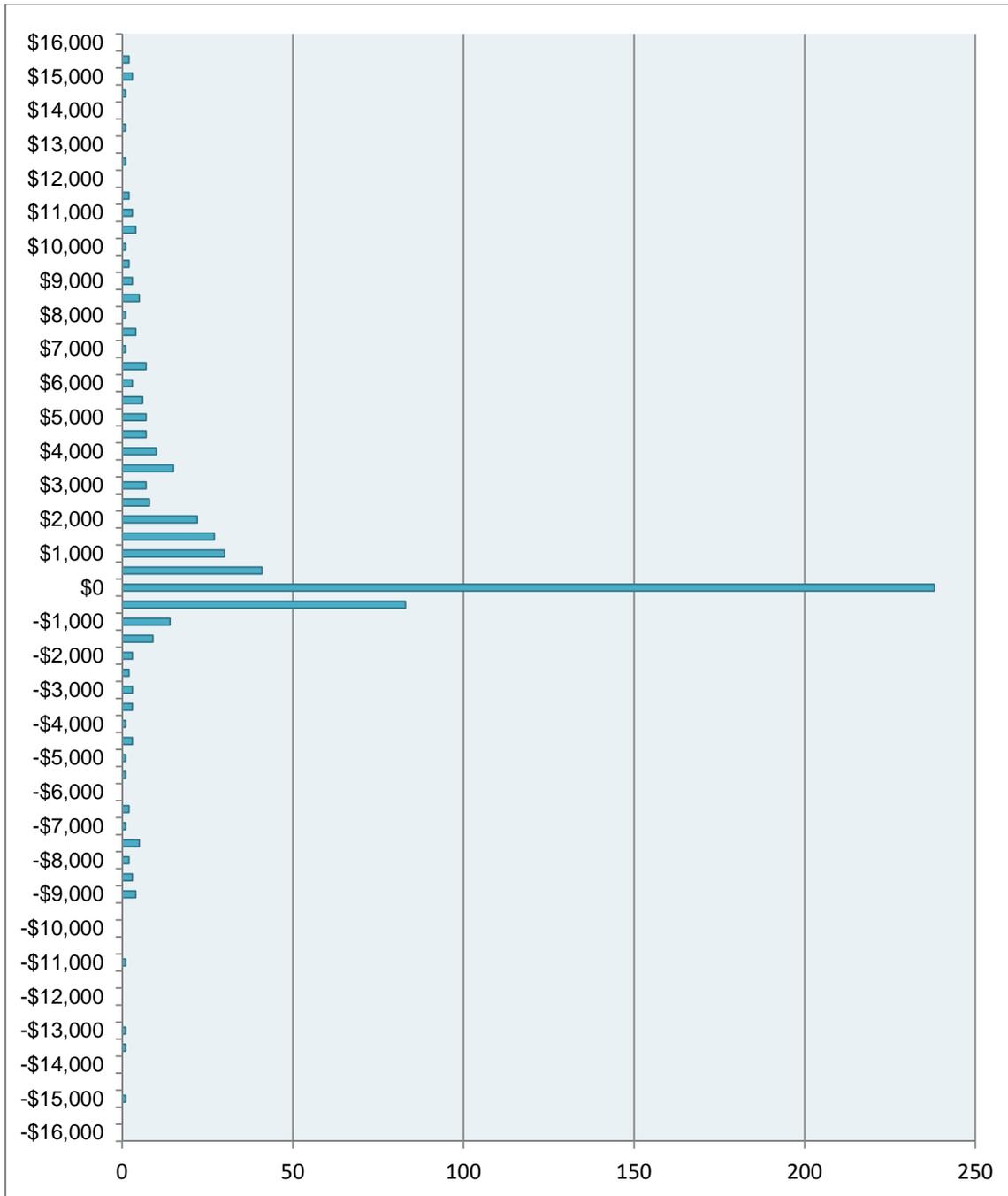
The major difference is that the short-form calculator does not produce need estimates greater than \$16,000 (the maximum estimate is \$15,013.05), whereas Brock's calculator estimates need up to \$31,000. There are 32 individuals who have an estimated need above \$16,000 when using the Brock calculator, but their need is shown as being under \$16,000 with the short-form calculator. It is likely that these 32 individuals have higher than normal expenses due to their marital or independent status or because they have dependents. None of these factors are captured in the short-form calculator.

Although the short-form calculator does produce a very different estimate of need for these 32 individuals, their "relative" need compared to others is still for the most part very similar. The average need for these 32 individuals based on the short-form calculator is \$13,513.24, which is near the top of the short-form calculator's range of assessed needs. Twenty-three of these individuals have need estimated by the short-form calculator within \$1,000 of the highest possible assessment, all but three have need greater than \$11,000, and only one has need less than \$6,500.

This last individual, with an assessed need of just over \$2,500, would still be flagged as a potential bursary recipient by the short-form calculator estimate, although they would be much closer to the cut-off than they would be using the Brock calculator. This case is unusual as the Brock calculator is producing an estimate of available resources that is not consistent with parental income, which suggests that this applicant may have been treated differently by the Brock calculator, perhaps as an independent student. (Although parental income was over \$100,000 the estimate of available resources was only \$307.)

Figure 2 shows the distribution of the difference in need estimate between the two calculators. Although the modal difference is near zero (actually between -\$500 and \$0), and the median difference is almost 0, meaning for these cases, both calculators produce very similar need estimates, there are large tails in both ends of the distribution showing that there are a number of cases where the two models are far apart.

**Figure 2 – Need Estimate Difference**



Note: the labels for the need estimate difference categories give the upper limit of the category.

Figure 2 shows that for a majority of applicants, the need estimates produced by both calculators are very similar. Most of the applicants are within \$2,000 of 'zero' difference; out of a total of 606 observations, 464 (76.6 per cent) are within \$2,000 of zero, 392 (64.7 per cent) are within \$1,000 and 279 (46.0 per cent) are within \$500. However there are some individuals who have either much higher or much lower need estimates with the short-form calculator compared to the Brock calculator. There are 50 applicants who have need that is higher by \$5,000 or more on the short-form calculator, and 23 applicants who have need that is lower by \$5,000 or more. The short-form calculator differs upward or downward in roughly equal proportion; 224 applicants (37.0 per cent) had higher need on the short-form calculator, 140 (23.1 per cent) had need that differed by a dollar or less between calculators, while 242 (39.9 per cent) had lower need on the short-form calculator.

Another way to assess the differences is to examine mean absolute difference, using the absolute values of the differences rather than the actual value. The mean absolute difference is calculated by taking the absolute value of the difference between the short-form calculator and the Brock calculator estimates for each applicant, and then taking the mean of these absolute differences. Unlike a simple average difference, this method means that a positive discrepancy, such as +\$1,000, does not cancel out a negative discrepancy (such as -\$1,000), and so it yields a measurement of how different the calculators are in absolute terms. The mean absolute difference between the two calculators is \$1,830.12, and the median absolute difference is \$570.73, showing that in absolute terms there is a sizable difference.

### Comparison of Bursary Eligibility

Another way of evaluating the two calculators is in terms of outcomes by examining who would be identified as a potential bursary recipient and who would not be by each calculator. In the applicant data supplied by Brock, all individuals with need of \$1,250 or greater were identified as a potential bursary recipient.<sup>1</sup> Using the need estimate from the short-form calculator, potential bursary recipients were identified for this calculator as well, and the outcomes were compared.

Each applicant was categorized into one of four categories depending on how the two calculators assessed their bursary eligibility. These categories are defined as "Both" for applicants who would receive an award under either calculation, "Brock only" for applicants who would receive an award under the Brock calculation but not the short-form calculator, "Short-form only" for the converse, and "Neither" for applicants who would not receive an award under either calculator. The distribution of applicants among these four categories is given in Table 3. Although the Brock calculator uses four times as many questions to derive its estimate of need, the short-form calculator produced essentially the same outcome for 91 per cent of the cases.

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<sup>1</sup> Other factors, in addition to the calculator, are used to make the final decision about whether or not to offer an applicant a bursary.

**Table 3 – Comparison of Bursary Eligibility Assessment by both Calculators**

Assessed as Eligible by:	Frequency	Percent
Both	473	78.1%
Brock Only	10	1.7%
Short-Form Only	44	7.3%
Neither	79	13.0%

In the following sections we consider the reasons for outcome differences for the 10 applicants who are only identified for a bursary by the Brock calculator and the 44 who are only identified by the short-form calculator.

### **Analysis of Reasons for Calculator Differences**

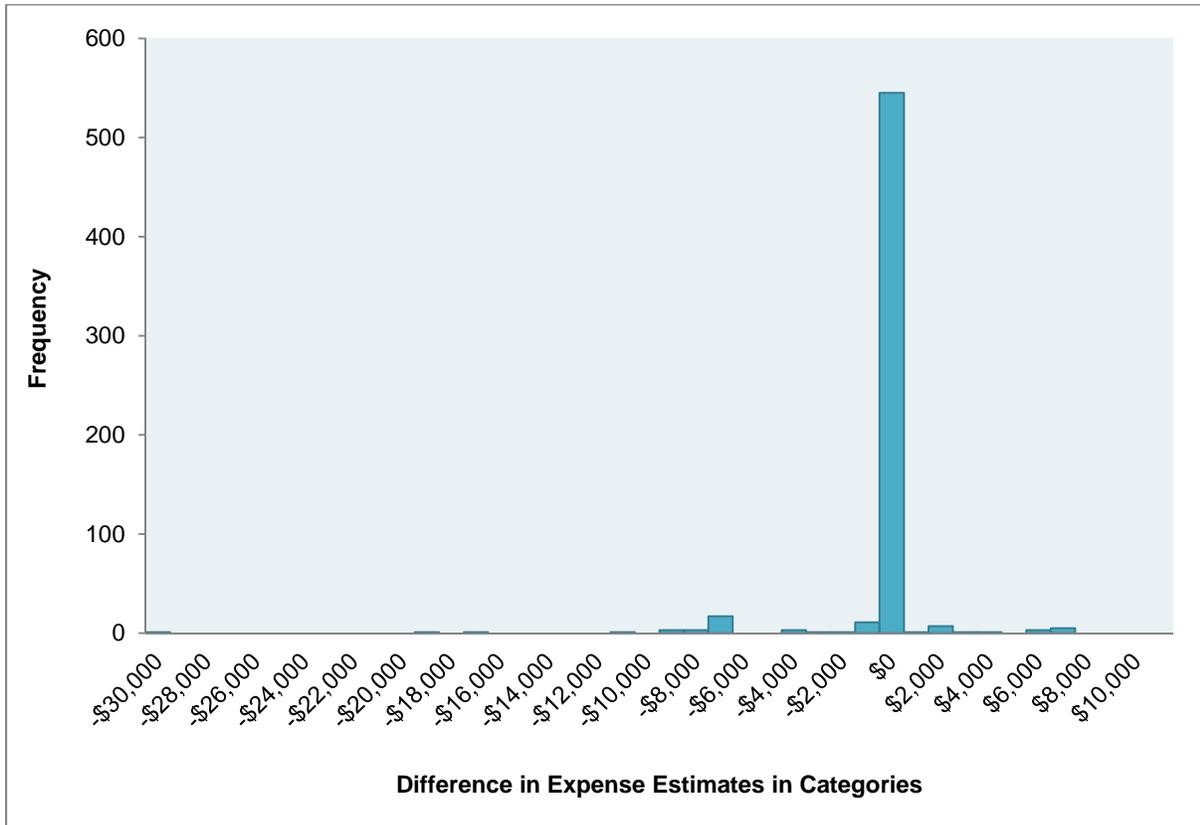
#### ***Expense Estimates***

There is very little variability in expenditure estimates by the Brock calculator. The vast majority of applicants have one of two estimated expenses. The first is \$16,539.50, the expenses corresponding to a single dependent student living away from home pursuing a full course load and paying domestic tuition; 413 students have exactly this level of estimated expenses. The second is \$10,999.50, the expense estimate for a single dependent student living at home (full course load, domestic tuition, etc.). This amount is estimated for 127 students. The remaining 66 students have expenses ranging from just over \$4,700 to just under \$48,000 (with 15 of these registering \$24,165.50 in estimated expenses).

The short-form calculator has even less variability. Only two estimates are possible: \$16,539.05 for students living away from home, and \$10,999.05 for students living at home. These estimates correspond to the two most common expense estimates on the long form calculator – the difference of 45 cents is due to a small, unintentional difference in the calculators' specifications, possibly due to rounding.

The difference in expense estimates for most applicants is minor, as can be seen in Figure 3. In fact, for the majority of applicants the difference in calculated expenses is effectively zero. Every single one of the 416 applicants who was estimated to have expenses of exactly \$16,539.50 with Brock's calculator was estimated to have expenses of exactly \$16,539.05 on the short-form calculator, for a difference of -45 cents. Each of the 127 applicants who was estimated as having expenses of \$10,999.50 by the Brock calculator was estimated with 10,995.05 of expenses by the short-form calculator, again for a difference of -45 cents. These differences do not represent an inherent limitation of the short-form calculator; rather, they are due to a small discrepancy in expense calculations between the Brock and the short-form calculators.

**Figure 3 – Differences in Expense Estimates by the Two Calculators**



Note: the labels for the expense estimate categories give the upper limit of the category.

Of greater interest for this assessment are the 66 other cases where applicants have less common expense profiles. These 66 applicants had expenses that were not equal to Brock's amount for either a single dependent student living at home or for a single dependent student living away from home. These special cases tend to have higher need on both calculators. The short-form calculator tends to estimate need about \$1,700 *lower* than Brock's calculator for the special cases, on average, while it estimates need about \$1,000 higher than Brock's calculator in the 'more common expenses' sample. The short-form calculator does not have the ability to estimate extra expenses for applicants with dependents, which may explain the discrepancy for at least some of the 66 cases.<sup>2</sup> It is also possible that some had international student tuition fees.

<sup>2</sup> Information on whether or not the applicant had dependents was not in the database that was analyzed for this assessment.

**Table 4 – Comparison of Need Estimates for Typical and Special Cases**

		Short-Form Need	Brock Need
Typical Cases	Mean	\$8,328	\$7,468
	Median	\$8,861	\$7,705
	N	540	540
Special Cases	Mean	\$10,374	\$12,032
	Median	\$13,045	\$13,286
	N	66	66

The difference in estimated need is about twice as large in the special cases sample, as is shown in Table 5. The *absolute* difference in estimated need is also a lot higher for the ‘special cases’ sample. The calculators are much more likely to estimate different need amounts for the special cases than for the typical cases (with an absolute difference of \$4,792 vs. \$1,468, respectively). In other words, the two calculators perform quite differently in calculating bursary eligibility for the special cases.

**Table 5 – Comparison of Differences in Estimated Need for Typical and Special Cases**

		Need Difference (Short-Form vs. Brock)	Absolute Need Difference (Short-Form vs. Brock)
Typical Cases	Mean	\$860	\$1,468
	Median	-\$1	\$496
	N	540	540
Special Cases	Mean	-\$1,659	\$4,792
	Median	-\$926	\$3,840
	N	66	66

Table 6 compares typical and special cases in terms of estimated expenses. For typical cases – that is, for the vast majority of people – there is essentially no difference in estimated expenses, as was discussed above. For the special cases, estimated expenses on the short-form calculator are lower than those on the Brock calculator (mean difference of -\$3,545.31; median difference of -\$1,604.95).

**Table 6 – Comparison of Estimated Expenses for Typical and Special Cases**

		Short-Form Expenses	Brock Expenses
Typical Cases	Mean	\$15,236	\$15,237
	Median	\$16,539	\$16,540
	N	540	540
Special Cases	Mean	\$15,448	\$18,993
	Median	\$16,539	\$18,144
	N	66	66

The special case sample also has a larger discrepancy in resources, as shown in Table 7. Compared to the short-form calculator, the Brock calculator estimates \$4,238.41 more in resources on average for special cases, compared to \$2,652.40 more for typical cases. The short-form calculator would be expected to underestimate resources somewhat because it uses less information on resources. That difference may be an important reason for the discrepancy in the 66 special cases.

**Table 7 – Comparison of Estimated Resources for Typical and Special Cases**

		Short-Form Resources	Brock Resources
Typical Cases	Mean	\$7,585	\$10,238
	Median	\$5,570	\$6,915
	N	540	540
Special Cases	Mean	\$6,977	\$11,215
	Median	\$2,276	\$3,545
	N	66	66

As Table 8 shows, there is less agreement between the two calculators in determining bursary eligibility for the 'special case' group; agreement for the typical case group is 92 per cent whereas for the special case group it is 83 per cent. The difference manifests primarily in a higher percentage of applicants being assessed as eligible for a bursary by the short-form calculator than by Brock's calculator.

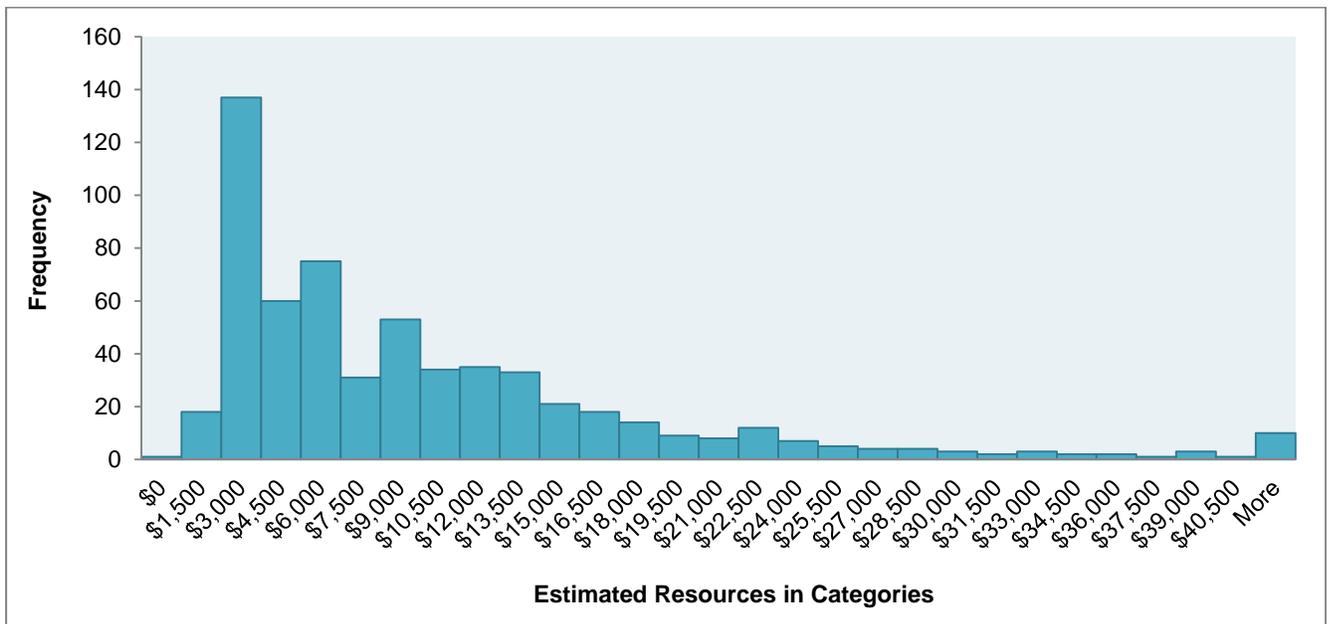
**Table 8 – Comparison of Bursary Eligibility Assessment for Typical and Special Cases**

	Typical Case		Special Case	
	Count	Percent	Count	Percent
Both	426	78.8%	47	71.2%
Brock Only	8	1.5%	2	3.0%
Short-Form Only	35	6.5%	9	13.6%
Neither	71	13.1%	8	12.1%

**Resource Estimates**

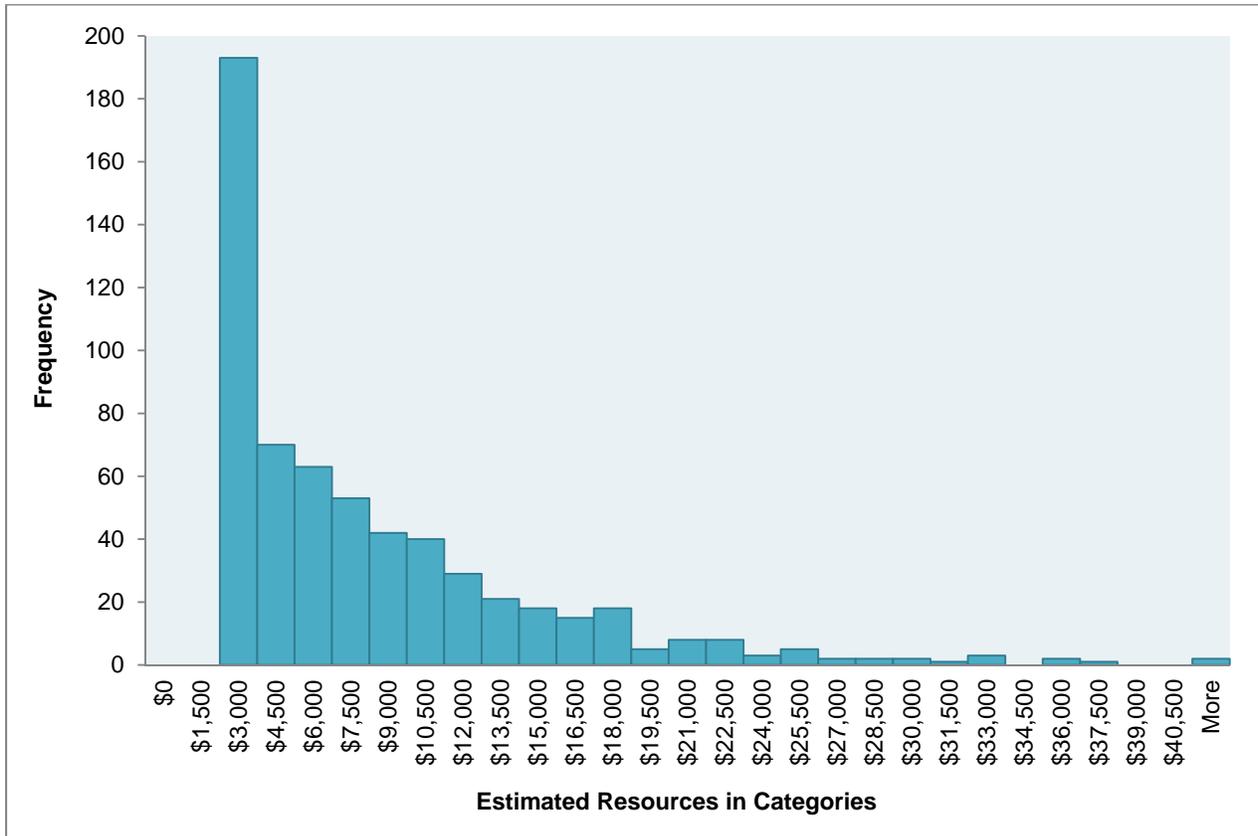
The other component used for estimating need is resources. The distribution of resources estimated by the Brock calculator is shown in Figure 4, while Figure 5 shows the estimates for the short-form calculator. The short-form calculator estimates lower resources on average because it assumes a pre-study contribution of only \$1,526 and no contribution during the school year. The sharp peak between \$1,500 and \$2,000 in Figure 5 represents students with only a pre-study contribution and no other resources based on the assumptions of the short-form calculator.

**Figure 4 – Resource Estimates by the Brock Calculator**



Note: the labels for the resource estimate categories give the upper limit of the category.

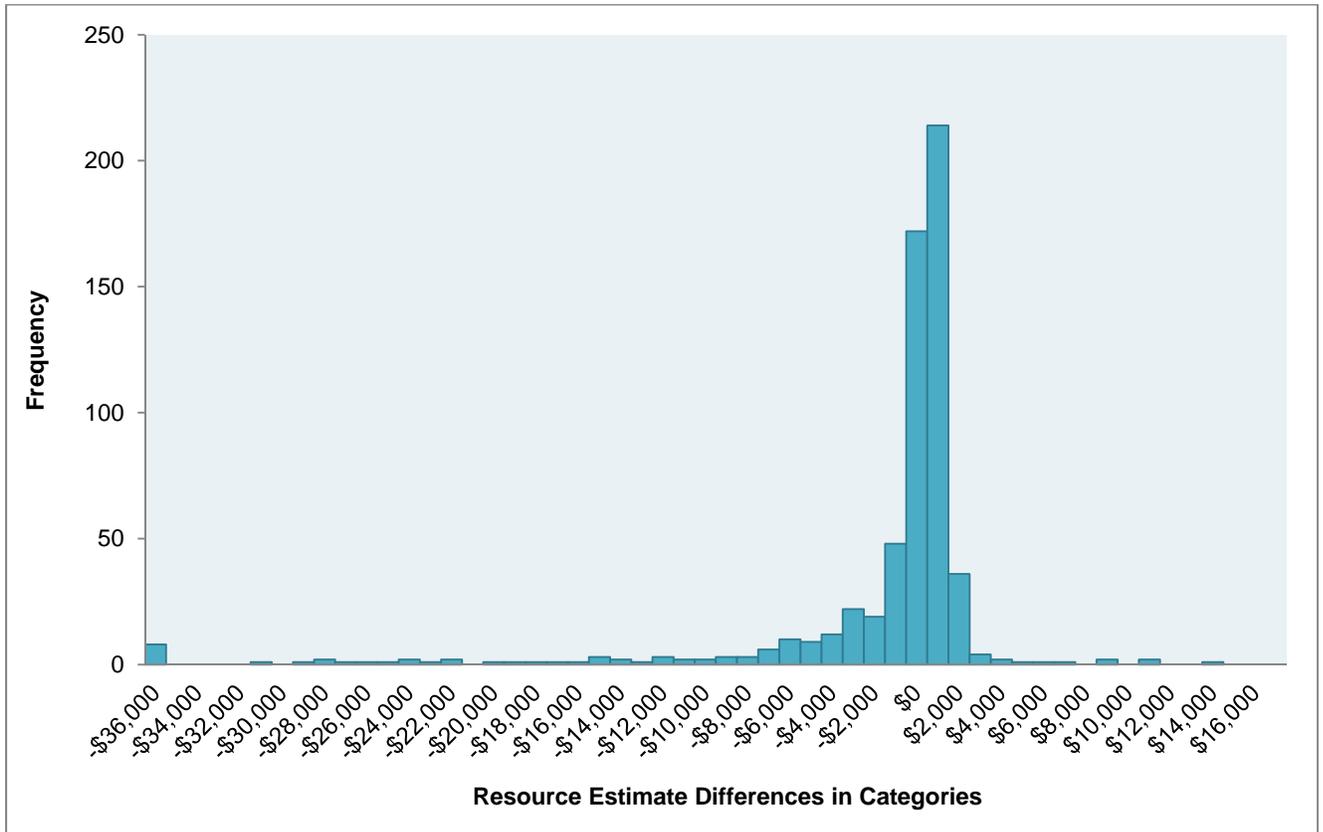
**Figure 5 – Resource Estimates by the Short-Form Calculator**



Note: the labels for the resource estimate categories give the upper limit of the category.

Figure 6 shows the differences in resource estimates between the two calculators. Although there is some variance, for the majority of cases the two calculators give similar estimates; the difference is within plus or minus \$1,000 of zero for 434 cases (63.7 per cent) and within plus or minus \$2,000 for 489 (77.6 per cent) of the cases. The distribution has a negative skew because the Brock calculator uses more resource information provided by the applicant and hence yields higher estimates.

**Figure 6 – Difference in Resource Estimates by the Two Calculators**



Note: the labels for the resource estimate difference categories give the upper limit of the category.

Applicants were categorized into quartiles using the value of the Brock resource estimates. Table 9 shows the mean and median resource estimates for each quartile, as well as the mean and median values of the short-form calculator resource estimates for the same applicants. The short-form calculator gives fairly similar resource estimates for applicants in the bottom two quartiles, while for the top quartile the short-form calculator produces estimates that are much lower than those produced by the Brock calculator. Table 10 compares the expense estimates for the two calculators for each resource quartile. Here, it is clear that the two calculators produce similar expense estimates for each quartile.

**Table 9 – Comparison of Resource Estimates for Each Quartile**

Brock Resource Quartile		Short-Form Resource Estimate	Brock Resource Estimate
1st Quartile	Mean	\$15,372	\$25,612
	Median	\$15,238	\$18,028
	N	151	151
2nd Quartile	Mean	\$8,247	\$9,372
	Median	\$8,476	\$9,060
	N	152	152
3rd Quartile	Mean	\$4,194	\$4,576
	Median	\$4,106	\$4,670
	N	152	152
4th Quartile	Mean	\$2,281	\$1,863
	Median	\$2,138	\$1,866
	N	151	151

**Table 10 – Comparison of Expense Estimates for Each Brock Resource Quartile**

Brock Resource Quartile		Short-Form Expense Estimate	Brock Expense Estimate	Difference
1st Quartile	Mean	\$15,548	\$15,986	-\$437
	Median	\$16,539	\$16,540	\$0
	N	151	151	151
2nd Quartile	Mean	\$15,081	\$15,130	-\$49
	Median	\$16,539	\$16,540	\$0
	N	152	152	152
3rd Quartile	Mean	\$15,154	\$15,690	-\$536
	Median	\$16,539	\$16,540	\$0
	N	152	152	152
4th Quartile	Mean	\$15,255	\$15,780	-\$525
	Median	\$16,539	\$16,540	\$0
	N	151	151	151

Table 11 compares how the two calculators perform in estimating need for the four quartiles. The two calculators produce similar estimates of need for all quartiles. The median need difference is 0, or almost 0, for all but the third quartile, which is -\$245. The mean differences are higher, especially for the top quartile, reflecting the fact that there are some outliers, especially in the top quartile. The top quartile includes two extreme cases. In one case, the applicant claimed \$500,000 in pre-study income and in the other case \$180,000. These two amounts are obvious errors, but these amounts are used in the Brock calculator. Pre-study income is not used in the short-form calculator, so these extreme values are not used at all in the short-form calculator.

Mean absolute differences are similar in magnitude for all but the top quartile (ranging from \$1,372 to \$1,626); for the top quartile, the mean absolute difference is about double this. It is in the top quartile, where applicants have the highest resources, where the two methods produce the greatest differences in estimating need.

**Table 11 – Comparison of Need Estimates for Each Brock Resource Quartile**

<b>Brock Resource Quartile</b>		<b>Short-Form Need Estimate</b>	<b>Brock Need Estimate</b>	<b>Need Difference</b>	<b>Absolute Need Difference</b>
1st Quartile	Mean	\$3,362	\$992	\$2,370	\$2,851
	Median	\$1,045	\$0	\$0	\$673
	N	151	151	151	151
2nd Quartile	Mean	\$6,871	\$5,830	\$1,041	\$1,626
	Median	\$7,102	\$6,156	\$0	\$774
	N	152	152	152	152
3rd Quartile	Mean	\$10,985	\$11,115	-\$130	\$1,475
	Median	\$11,483	\$11,392	-\$245	\$597
	N	152	152	152	152
4th Quartile	Mean	\$12,980	\$13,918	-\$938	\$1,372
	Median	\$14,325	\$14,402	-\$1	\$307
	N	151	151	151	151

Table 12 compares the bursary eligibility assessment of the two calculators for each of the resource quartiles. Almost all of the discrepancies occur in the first quartile, the group with the highest level of resources. For the third and fourth quartile, the two calculators yield the same assessment for 99 per cent of the applicants. For the second quartile, the same assessment is made for 94 per cent of applicants. However, in the first quartile the two calculators only give the same assessment for 72 per cent of applicants. The short-form calculator identifies more applicants in the first quartile as eligible for the bursary than does the Brock calculator because the Brock calculator considers some resources that the short-form calculator does not. Of all

discrepancies in assessing bursary eligibility, 78 per cent occur with applicants in the first (highest) quartile.

**Table 12 – Comparison of Bursary Eligibility Assessment for Each Brock Resource Quartile**

	Brock Resource Quartile				Overall
	1 <sup>st</sup> Quartile	2 <sup>nd</sup> Quartile	3 <sup>rd</sup> Quartile	4 <sup>th</sup> Quartile	
Both	24.5%	89.5%	98.7%	99.3%	78.1%
Brock Only	4.0%	1.3%	0.7%	0.7%	1.7%
Short-Form Only	23.8%	4.6%	0.7%		7.3%
Neither	47.7%	4.6%			13.0%

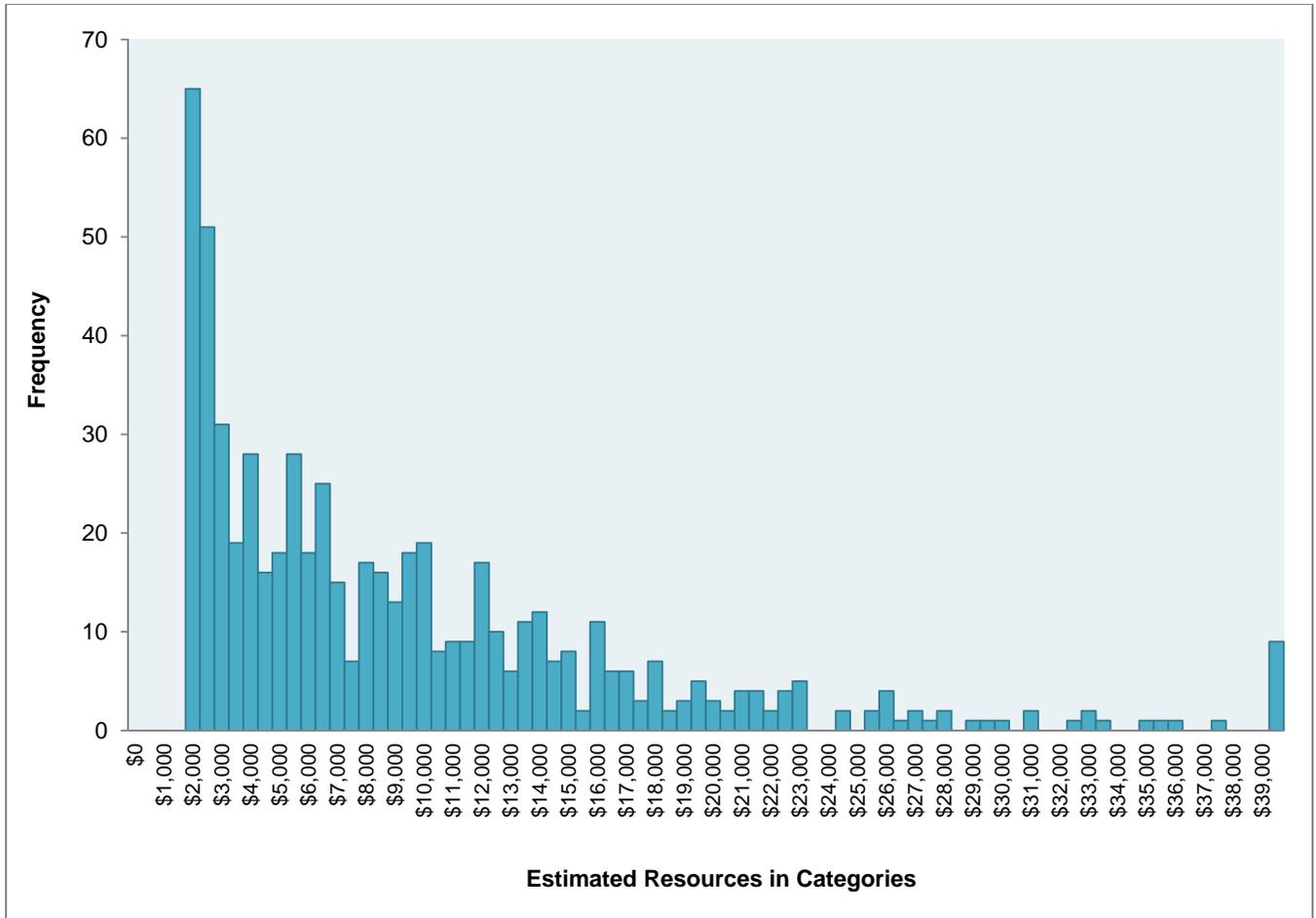
### Modifying the Short-Form Calculator

A significant reason for the discrepancy between the Brock and the short-form calculators is their treatments of student resources. While the Brock calculator asks questions about parental income, pre-study period income, study period income, scholarships, and other resources, the short-form calculator omits questions on pre-study and study period income, and assumes students contribute the minimum \$1,526 for the former and \$0 for the latter. It should be possible to further increase the agreement between the two calculators by adding the two questions on study period and pre-study income to the short-form calculator, thus increasing the number of questions used in the revised short-form from five to seven.

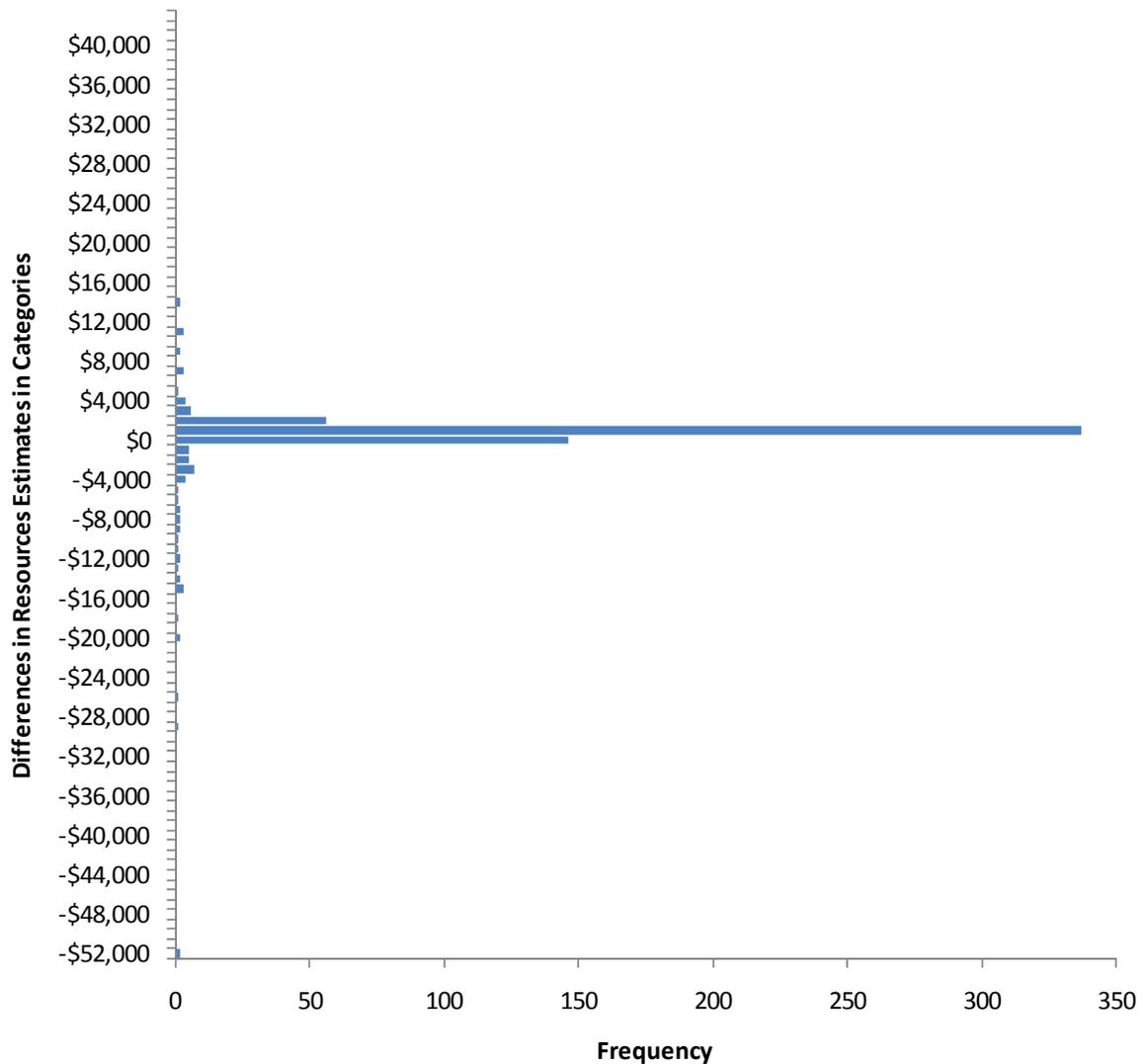
This revised short-form calculator treated parental income, scholarships, and other resources as it did in the original short-form calculator. To determine the contribution from pre-study income, the revised short-form calculator subtracted estimated tax and a monthly living allowance from the pre-study income (both calculations taken from the need tables of Brock’s calculator), and then assumes a contribution of 80 per cent of the remainder, or \$1,526, whichever is larger. For study period income, the calculator subtracts the estimated tax and an income exemption of \$1,700, and then expects a contribution of 80 per cent of the remainder. In both cases, the revised short-form calculator uses the methods, need assessment and tax tables described in the specifications of the Brock calculator to determine the expected contribution; the intent is to produce the same expected contribution as the Brock calculator when using the same data.

Figure 7 shows the estimated resources for the revised short-form calculator. With the addition of the two resource questions, the calculation of mean resources has increased from \$7,519 to \$10,045. Differences between the resource estimates for the revised short-form and the Brock calculators are shown in Figure 8. The revised short-form calculator produces resource estimates that are closer to those generated by the Brock calculator. Whereas 434 cases (63.7 per cent) were within \$1,000 of zero difference previously, with the revised short-form calculator 488 cases (80.5 per cent) are. In addition, 549 cases (90.6 per cent) are within \$2,000 of zero difference with the revised short-form calculator compared to 489 (77.6 per cent) with the original short-form calculator.

**Figure 7 – Resource Estimates by the Revised Short-Form Calculator**



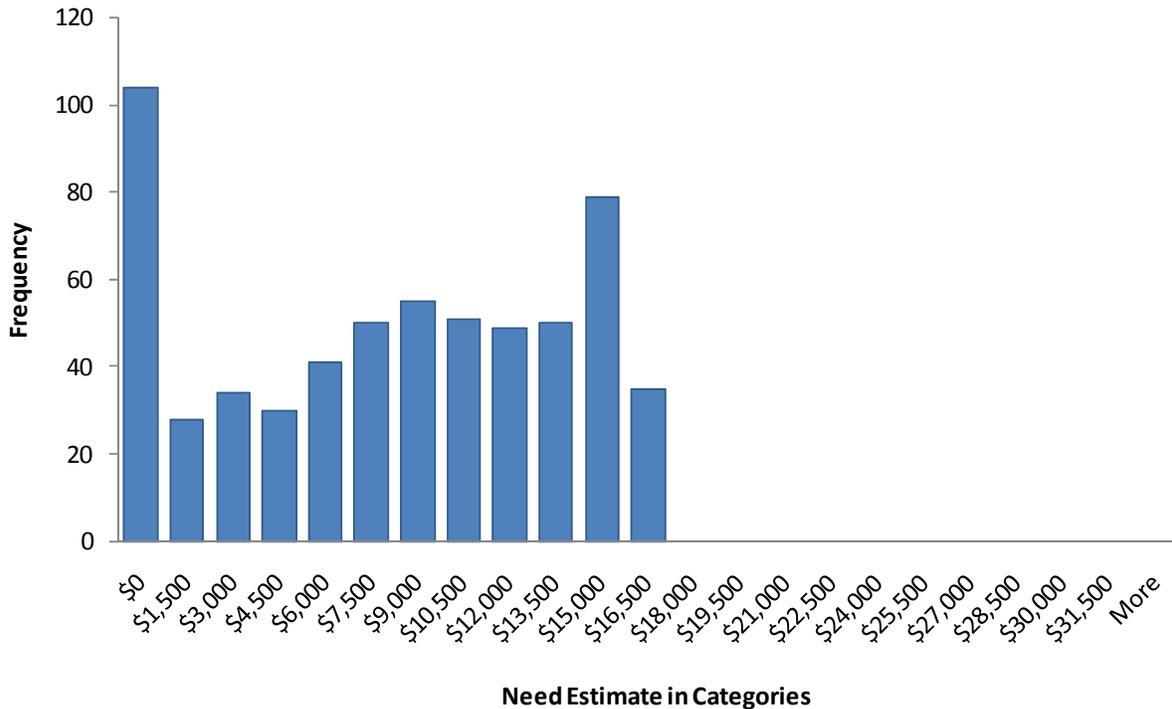
**Figure 8 – Difference in Resource Estimates by the Brock and Revised Short-Form Calculators**



The need estimates derived from the revised short-form calculator are shown in Figure 9. The effect of increasing the resource estimates is to shift the distribution of need somewhat to the left of the figure. In other words, need estimates are decreasing. The revised short-form calculator results in more people with zero need (104 vs. 73) than with the original short-form calculator, and fewer people with need within \$1,000 of the highest need possible with the short-form calculator (94 vs. 127). Table 13 compares the need estimates for the three calculators. Whereas the original short-form calculator overestimated need compared to the Brock calculator, the revised short-form underestimates need. However, the revised short-form does provide need estimates that are closer to the estimates given by the Brock calculator, as

evidenced by a difference in the medians of only \$46, compared to \$1,229 for the original short-form calculator.

**Figure 9 – Need Estimates by the Revised Short-Form Calculator**



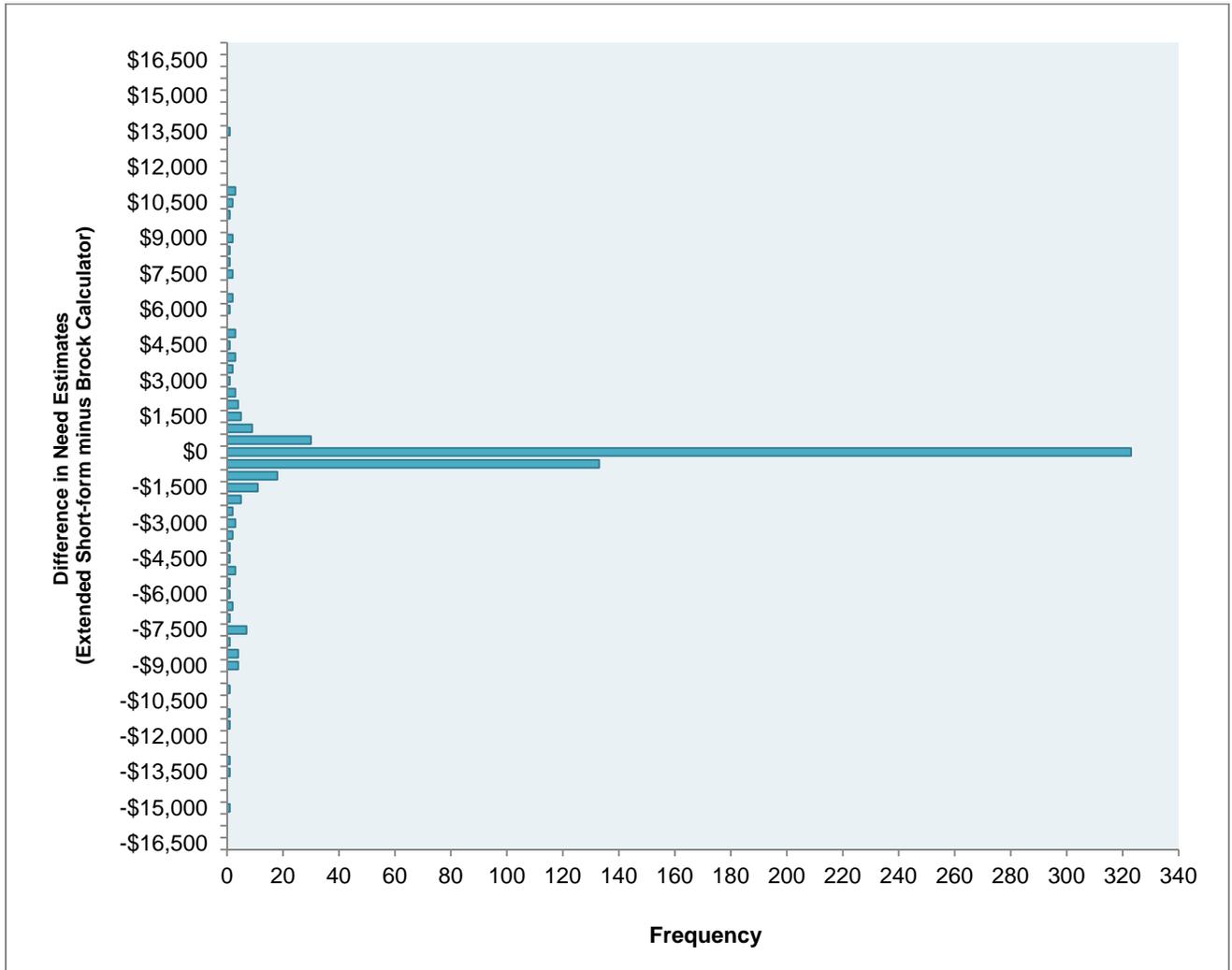
**Table 13 – Comparison of Need Estimates for all Three Calculators**

	Mean	Median
Brock Calculator	\$7,965.17	\$8,123.00
Original Short-Form Calculator	\$8,550.42	\$9,352.05
Revised Short-Form Calculator	\$7,523.45	\$8,076.97

Figure 10 shows the differences between the need estimated from the Brock calculator and the revised short-form calculator. The mean difference is now \$-441.72 compared to \$585.25 with the original short-form calculator (the revised short-form calculator is now estimating need below that of the Brock calculator). Now 533 cases (88.0 per cent) are within \$2,000 of zero, compared to 464 (76.6 per cent) with the original short-form calculator. This includes 353 (58.2 per cent) within \$500 of zero, compared to 279 applicants (46.0 per cent) previously and 495 (81.7 per cent) within \$1,000 of zero, compared to 392 (64.7 per cent) previously. There still are a number of cases with fairly large discrepancies, though. Likely these are cases with

circumstances that the revised short-form calculator is not designed to handle, such as independent students and those with dependants.

**Figure 10 – Difference in Need Estimates by the Brock and Revised Short-Form Calculators**



**Table 14 – Comparison of Bursary Eligibility Assessment by both Calculators**

	With Revised Short-Form		With Original Short-Form	
	Frequency	Percent	Frequency	Percent
Both	462	76.2	473	78.1
Brock Only	21	3.5	10	1.7
Short-Form Only	17	2.8	44	7.3
Neither	106	17.5	79	13.0

Adding the two resource questions to the calculator has increased the agreement of the revised short-form and Brock calculators, but the improvement is small. Now there is 93.7 per cent agreement (either both determine the applicant is eligible or neither do) where previously there was 91.1 per cent agreement. The greater agreement is due to an increase in the number of people who were determined not to be eligible for awards by either calculator, while the number of people who received awards on both actually went down (i.e., the revised short-form calculator is now less willing to give out awards), but this was more than offset by the increased agreement on not handing out awards.

Clearly, complicating the calculator by adding two more questions does not result in a sufficient improvement in the calculator's ability to predict bursary eligibility to justify adding the two questions. The original five question short-form calculator does just as good a job at predicting bursary eligibility, even though the revised short-form calculator does a better job at predicting need.

This apparent contradiction is the result of the fact that bursary eligibility does not require the same precision as does need estimation. All the calculator needs to do is predict which applicants will have financial need of at least \$1,250. The revised short-form calculator is only a little better at predicting which applicants will have need of at \$1,250 as determined by the Brock calculator. Being able to more precisely estimate the level of need does not matter as long as the calculator can accurately predict whether or not the need will exceed the \$1,250 cutoff.

There is another reason to forgo questions about pre-study and study-period income, irrespective of the degree of agreement between the two calculators. Adding questions about pre-study and study-period income does not necessarily improve the precision of the resource estimate compared to what the applicant's real resources will actually be for either calculator, because the applicant does not know this information at the time of application, so the questions require them to estimate future income. Since the application is done in the winter, these income estimates are made long before the summer begins. The study period is even more of an issue, as the applicant may have no idea of what employment they will have while in school. Therefore questions about pre-study and study period income likely do not improve the accuracy of the model. Using estimates for these amounts, as is done in the five-question short-form at least acknowledges that the information is only an estimate.

## Survey Analysis

All applicants who completed Brock's bursary application form in January and February of 2010 were invited to complete an on-line survey to obtain their views on the application process. The survey (see Appendix B for the survey questions) was administered between January 25 and March 6, 2010.

### Survey Respondents

Of the 622 applicants for the Brock University Entering Student Bursary, only 229 completed the survey. To determine whether those 229 are representative of all applicants, the survey respondents were compared to the non-respondents in terms of living status, parental income and other resources. The results are presented in Table 15.

**Table 15 – Comparison of Survey Respondents and Non-Respondents**

		Respondents	All Applicants
Living Status	At home	19.7%	22.8%
	Away	80.3%	77.2%
Parental Income	< 30,000	21.8%	20.4%
	\$30,000-59,999	27.1%	25.2%
	\$60,000-89,999	24.5%	24.4%
	\$90,000-119,999	11.4%	15.2%
	\$120,000+	14.0%	13.9%
Resources	Mean	\$11,176	\$10,573
Expenses	Mean	\$16,304	\$15,823
Need*	Mean	\$8,207	\$7,966

\* As estimated in the Brock calculator

Overall it appeared that the survey respondents were similar to all applicants, although there were some small differences. Those who answered the survey were somewhat more likely to be living away from home and to have family income of less than \$60,000, yet their total financial resources were higher, on average, when compared to all applicants. Respondents also had higher estimated expenses and somewhat higher estimated need.

## Survey Results

### *Views on the Brock University Entering Student Bursary Application*

Table 16 shows respondents' reasons for applying for the bursary. Three quarters of the respondents applied for the bursary to maximize their access to funding, and half of them felt that student financial assistance would not be sufficient to cover their costs.

Views about the application process are presented in Tables 17 and 18. Generally respondents were satisfied with the application process: 85 per cent were satisfied with the length, 82 per cent felt the level of detail was appropriate and 86 per cent felt that the amount of time it took to complete the application was appropriate (42 per cent of respondents took between 15 and 30 minutes to complete the application; and 55 per cent felt the parental income section took the longest to complete). Seventy per cent of respondents felt that the application accurately captured their entire financial profile.

**Table 16 – Reason for Applying for Bursary\***

I want to have access to as much funding as possible	75.1%
Government student financial aid will not be sufficient to cover my cost	50.2%
I was told I should apply	30.1%
I was not eligible for government grants or loans	9.6%
I do not know	0.4%

\* Respondent could select all that applied

**Table 17 – Views on the Bursary Application**

Application Length	Neither too short nor too long	85.1%
	Don't know/not sure	9.9%
	Too long	4.5%
	Too short	.5%
Level of Detail of Application	Appropriately detailed	82.4%
	Not detailed enough	8.6%
	Too detailed	5.0%
	Don't know/not sure	4.1%
Views on Time Required to Complete Application	An appropriate amount of time	86.0%
	Too much time	8.6%
	Don't know/not sure	3.2%
	Not enough time	2.3%

**Table 18 – Views on the Bursary Application Continued**

Time Taken to Complete Application	Less than 15 minutes	15.3%
	15 minutes to just under 30 minutes	42.6%
	30 minutes to just under 1 hour	33.3%
	1 hour to just under 3 hours	7.4%
	3 hours or more	1.4%
Portion of Application that took the longest*	Parental income	55.9%
	Summer income/Study period income	45.0%
	Other Costs	23.6%
	Savings	22.3%
	Status	12.2%

\* Respondent could select all that applied

**Table 19 – Other Views about the Application**

Felt application accurately captured their entire financial profile	69.9%
Felt there was sufficient space to provide other significant information about financial profile	91.7%

### *Student Financial Aid Plans*

Respondents' plans for 2011-2012 with respect to student financial assistance are shown in Table 20. Ninety per cent of respondents intended to apply for other institutional bursaries in the following year if their financial circumstances remained the same. Half intend to apply or expect to receive some form of non-repayable assistance not from the government or an institution, and just over a third will apply for, or expect to receive, a private student loan. Eighty-two per cent of respondents intended to apply for OSAP for the 2011-2012 academic year.

Reasons for not applying for OSAP are provided in Table 21. Half of those who did not plan to apply would not because they do not want to incur debt, and 45 per cent felt they were not eligible.

**Table 20 – Student Financial Assistance Plans for 2011-2012**

Plan to apply for other institutional bursaries next year if financial circumstances next year are the same as they are now	89.5%
Plan to apply for a loan from the Ontario Student Assistance Program (OSAP)	81.7%
Will apply for/receive money from a bursary, grant, or scholarship from a source other than a university or government (e.g. an employer, union, club or corporation)	50.7%
Will apply for/receive money from a private loan or a student line of credit from a bank	34.9%

**Table 21 – Reasons for Not Applying for Ontario Student Assistance Program for 2011-2012\***

I do not want to have debt	50.0%
I already know that I am not eligible for OSAP	45.2%
I do not feel that I will need money from OSAP	9.5%
I was not aware that I could apply	9.5%
I do not have the necessary financial details to complete the OSAP application	7.1%
I do not know	2.4%
The application process for OSAP is too long	0%

## Conclusions

The short-form calculator, which is derived from the original CanEd calculator and uses only 5 questions, compares favorably with Brock's original long-form application process, which uses four times as many questions. In 91 per cent of cases, the two approaches yield the same assessment of bursary eligibility. For typical cases, single dependent students, the five question short-form calculator performs well. For the 66 special cases, the two calculators yield different need estimates because they estimate very different resource amounts. When the two models were compared by resource quartile, it became apparent that for applicants with high levels of resources, the short-form calculator gives lower estimates of resources, and as a result higher estimates of need.

The resources that are excluded in the short-form calculator are all resources that the student has to estimate: future income for the pre-study period and future income expected during the study period. These resource estimates are included in the Brock calculator. It is possible, therefore that the Brock resource estimates may not be a fully accurate assessment of the applicant's financial situation since applicants, usually current high school students applying prior to admission, are being asked to estimate how much money they will be making five months later, during the summer, and nine months later while at university.

The short-form calculator could easily be modified to produce results closer to those of the Brock calculator simply by adding two questions about pre-study and in-school expected earnings. Adding a question about dependent children, meanwhile, would allow the model to make more accurate estimates for students with dependents. These changes would result in an eight question calculator, which is still much smaller than the 20 question calculator currently used by Brock. However, the evidence presented in this report suggests that adding two questions about pre-study and in-school expected earnings does not improve the model sufficiently to be worth doing.

One factor that makes a difference in how resources are determined for government financial assistance is whether or not the student is deemed to be dependent on parental support. This is determined by a number of factors. Generally, students who have dependents or are married are considered independent of their parents. Students who have been out of high school for at least 4 years or have worked for at least two consecutive years are also usually considered to be independent. All others are considered as dependent on parental support, and parents are expected to contribute a portion of their income when determining the student's financial need. Both calculators could be improved by asking the parental income question differently. Applicants could be asked to provide parental income only if the following conditions apply: the applicant has no dependents, is not married, has been out of high school for less than four years and has been working for less than two years. This is a minor point, though, since most applicants will likely continue to be direct entry students.

What would be gained by reducing the number of questions asked when applying for Brock University's Entering Student Bursary? Clearly, reducing the number of questions decreases the amount of time required to complete the application. However, the survey results shows that the

respondents were not concerned about the length of time required to complete the application. The survey does not tell us about the views of high school students who did not apply for a bursary. We have no way of knowing whether there are potential applicants who did not apply for a bursary because they were daunted by the number of questions and the type of information they would be required to supply. In particular, questions that the applicant does not know how to answer or is uncomfortable asking their parents about, such as earnings while in university or parental earnings, may have deterred some from applying for the bursary. Another advantage of reducing the number of questions is that it would simplify the calculator and hence require less staff time to conduct the needs assessment. It also reduces the amount of noise in the data, where students are estimating information they do not know.

Of course there are drawbacks to consider with using fewer questions. Fewer questions work well when all the applicants fit the assumptions behind the calculator. The short-form calculator was intended for students who are dependent on parental support when assessing need for financial assistance, and have no dependents of their own. In addition to asking more questions, the Brock bursary application process has some flexibility by allowing applicants to add information about their financial circumstances that might not be captured by the questions, which allows the institution to deal with truly special cases.

A compromise between the two calculators might be the most effective approach. Reducing some of the questions where students may not really have the answers, such as information on their in-study earnings, but keeping some of the questions that are not included in the short-form calculator, such as marital status and number of dependents, may provide the best balance between response burden for the applicant and accuracy in assessing need. Another compromise approach could involve an applicant screening process, which would list all of the assumptions within the short-form calculator. Those applicants who meet all of the assumptions would be directed to complete the shorter application, while applicants with more complicated circumstances would be directed to the longer form.

The focus of the research reported here was about predicting bursary eligibility. Hence the short-form calculator was adjusted to match the way Brock estimates need for this purpose. We have not compared either calculator's ability to estimate need for the purposes of assessing eligibility for federal and provincial student financial assistance. It would be interesting to see how well the short-form calculator does at calculating assessed need for student assistance purposes. This kind of research would determine to what extent the current process for applying for financial assistance could be simplified. A simplified process would not only be easier for students to complete, but would make it possible for students to more easily estimate the amount of assistance they would be eligible for long before they receive the assessment results from the financial aid program. This information is important as high school students make plans for postsecondary education, so being able to predict the amount of assistance to expect, at least with a reasonable degree of accuracy, would be a great benefit.

## Appendix A: Brock University Entering Student Bursary Application

The information supplied on this form should pertain to your upcoming Fall/Winter budget information.  
**This Profile is submitted for:** Entering Students Bursary (2011-2012)

**Your Brock Id Number:**  — 7 digit number  
*What's this?*

**or OUAC Number**  — not required if Brock ID is entered.

**11 Digit Number:** *What's this?* \*\* REPLACE THE LAST DIGIT WITH A ZERO \*\*, Do not enter hyphens  
eg. 2005-1234567 should be entered as 20051234560

**Your Name:**

**Your e-mail account:**

**Your Marital Status:**  Single  
 Married  
 Single Parent

**If Married, is your spouse a full-time student?:**  Yes  
 No

**Your Citizenship:**  Canadian Citizen  
 Permanent Resident Status  
 Student or Other Visa

**Your Residency**

*What's this?*

**Please mark all of the following statements Yes (True), or No (False) Enter 'No' if Not Applicable:**

I have lived in Ontario for 12 consecutive months before beginning my studies at Brock.

Yes  No

My parents have lived in Ontario for 12 consecutive months before beginning my studies at Brock.

Yes  No

My spouse has lived in Ontario for 12 consecutive months before beginning my studies at Brock.

Yes  No

**Where were you living during your Pre-Study Period?:**

*What's this?*

At Home

Away from Home

Note: "At Home" refers to your parent's home.

**Where will you be living during your Study Period at Brock?:**

*What's this?*

At Home

Away from Home

Note: "At Home" refers to your parent's home.

**What year did you graduate from High School?**

**Are you an Entering, Returning or Graduating student?**

Entering

Returning to Undergraduate Study

Returning to Graduate Study

Graduating

**How many credits will you register for in the coming Fall/Winter Session? (5.0 is a normal full-time course load)**

Parents' Gross Annual Income Range (i.e. before taxes) ?

Parents include step-parents and legal guardians. If your parents are divorced or separated, please include support payments.

If Married, Spouse's Gross Annual Income (i.e. before taxes)?

Total of your Gross Income for the Pre-study Period. (i.e. before taxes, please estimate, if not known) \$

**DO NOT INCLUDE LOANS:**

*What's this?*

**Whole numbers only, do not enter \$, or commas**  
What is the source of these funds? (enter N/A, if no income)

Will you be studying Full-time during the Pre-study Period?  Yes  No

*What's this?*

Total of your Gross Income for the Study Period (i.e. before taxes, please estimate, if not known): \$

*What's this?*

**Whole numbers only, do not enter \$, or commas**  
What is the source of these funds? (enter N/A, if no income)

Total of Scholarships/Awards/Tuition Waivers expected: \$

**Whole numbers only, do not enter \$, or commas**  
What is the source of these funds? (enter N/A, if no income)

Total of Other Resources before your Pre-Study Period began (include GIC, Bond, Bank balances and RESP withdrawals for the study period): \$

**Whole numbers only, do not enter \$, or commas**  
What is the source of these funds? (enter N/A, if no income)

**Do your parents work at Brock University?**  Yes  No

**Are you intending to apply for an OSAP Loan?**  Yes  No

**Are you intending to apply for a Personal Student Loan?**  Yes  No

**How many people are in your family, including yourself?**

**How many people in your family are attending a post-secondary institution, including yourself?**

**How many dependent children do YOU have?**

*What's this?*

**How many of YOUR dependent children require day-care?**

### Comments

Please comment on your financial position and your ability to afford your educational costs. Include any additional or unusual costs and expenses that you would like us to be aware of.

Clicking the "Submit my Profile" button at the bottom of the page, will complete your profile.

Please indicate your total indebtedness from all sources, including OSAP and personal loans here: \$

## Appendix B: Short-Form Calculator's Method of Estimating Need

Assessed need is equal to assessed expenses minus assessed resources, or \$0, whichever is greater.

### Expenses Assessment

Assessed expenses = living expenses + tuition and books.

### Living Expenses

If the student is living at home, living expenses are \$475 / month (Brock's assessed amount for a single dependent student without dependents living at home).

- If the student is living away from home, living expenses are \$1,115 / month (Brock's amount for a single dependent student without dependents living away from home)
- LF-Students living away from home receive a \$100 total allowance for two return trips home.
- Students are assessed 8.5 months of living expenses
- Since the only variable above is whether the student lives at home or away from home, total expenses are either \$9,578 for students living away from home or \$4,037.50 for students living at home.

Note that no consideration is made of international student status, whether a student is dependent or independent, whether a student has dependents, where a student has a family member that works at Brock, or the actual expected number of courses the student will be taking, all of which would affect expenses.

### Tuition and Books

- Program tuition: \$1,066.11 per class times an assumed five classes, for a total of \$5,330.55
- A health fee of \$131 is added, for a total of \$5,462, as per the Brock long-form calculator
- Books: \$300 per class times an assumed five classes, for a total of \$1,500.

### Resources Assessment

Assessed resources = Contribution from Parental Income + Pre-Study Contribution + Study-Period Contribution + Scholarships and Tuition Waivers + Other Resources

### Spousal Contributions

No spousal contribution is expected on the short-form calculator.

## Parental Contribution Formulas

As the short-form calculator does not differentiate between dependent and independent students, a parental contribution is always calculated (although this contribution may equal \$0 depending on the result of the calculation). This calculation mimics that of the long-form calculator – the only difference is that some categories of students (e.g. single dependent students) are exempt from the parental contribution requirement on the long form calculator.

One of three parental contribution calculations is used, depending on income and family size:

- 1) If income falls below Minimum A in Table A.5. for the corresponding number of family members, no contribution is expected.
- 2) If income falls between Minimum A and Maximum B in Table A.5 for the corresponding number of family members, Formula A is used (described below).
- 3) If income is above Maximum B in Table A.5 for the corresponding number of family members, Formula B is used (described below).

### Contribution from Parental Income – Formula A (for lower income)

- Minimum A (corresponding to the number of family members) is subtracted from the declared total family income. The result is multiplied by 0.0014706, giving a subtotal.
- The amount \$2.94116 is added to the sub-total. The result is then rounded to the nearest dollar. This amount is the weekly contribution under Formula A.
- The weekly contribution under Formula A is multiplied by the weeks in the session (34). This final result is the Total Expected Parental Contribution.

The overall formula is:

Total Expected Parental Contribution =

$34 * \text{ROUND}( 0.0014706 * (\text{Total family income} - \text{Minimum A}) + \$2.94116)$

Where 'ROUND()' indicates that the quantity in parentheses is rounded to the nearest dollar.

### Contribution from Parental Income – Formula B (for higher income)

- Parental income data was provided in ranges of \$10,000 (\$0-\$9,999; \$10,000-\$19,999; etc., up to \$200,000 and above). The midpoint of the range is used for the parental income calculation; for individuals with parental income above \$200,000, \$200,000 is used. Call this value *income*.
- *Income* is divided in half (two parents assumed).
- Estimated tax is deducted from (*income* / 2) to determine after tax income for one parent
  - Estimated tax on parental income is derived from Table A.1, Parent/Spouse Estimated Tax Rates, from Brock's need assessment. The amount of tax deducted is given by Algorithm A.1 – Estimated Tax on Parental Income, provided at the end of this section
- After tax income for one parent is then multiplied by two to obtain total after tax income

- A Moderate Standard of Living Allowance (Table A.2), which depends on total family size, is then deducted from total after tax income to determine Estimated Discretionary Income (EDI)
- Parents are expected to contribute 35% of the first \$3,000 of EDI above zero, 45% of the next \$3,000, and 55% of the remainder. An *additional* contribution of 3% of *after tax income* is also expected.
- The contribution is divided equally among all siblings in PSE (i.e. the above amount is then divided by the number of siblings in post-secondary to determine the contribution to the applicant).
- The expected contribution from parental income is thus given by:
  - Contribution to Applicant = (Total Contribution) / (# of siblings in PSE, including applicant)
  - Total Contribution = Sub-Total + 0.03\*(Total After Tax Income)
  - If(EDI < \$0) Sub-Total = \$0.  
 If(EDI <= \$3,000) Sub-Total = 35% \* EDI;  
 If(\$3,000 < EDI <= \$6,000) Sub-Total = 45% \* (EDI – 3000) + 35% \* 3000;  
 If(EDI > \$6,000) Sub-Total = 55% \* (EDI – 6000) + 45% \* 3000 + 35% \* 3000;  
 Where:
    - $EDI = Total\ After\ Tax\ Income - Moderate\ Standard\ of\ Living\ Allowance$
    - $Total\ After\ Tax\ Income = 2 * ((income/2) - (tax\ on\ (income/2)))$

### Contribution from Pre-Study Income

- Pre-study income is reduced by estimated tax on pre-study income. Estimates are derived from Table A.3; the resulting algorithm is Algorithm A.2 – Tax on Pre-Study Income. A pre-study period of ten weeks is assumed.
- Post-tax pre-study income is further reduced by a living allowance of \$986. The living allowance assumes a ten week study period during which the student lives at home.
- The applicant is expected to contribute either 80% of the remainder of pre-study income, or \$1,526) whichever is larger.
- The overall formula is therefore  $Pre\text{-}Study\ Contribution = MAX(0.8 * (Pre\text{-}Study\ Income - Tax\ on\ Pre\text{-}Study\ Income - \$986), \$1,526)$ .

### Scholarships and Tuition Waivers

- Expected contribution is 100% of the amount entered

### Other Resources

- Expected contribution is 100% of the amount entered

Note that no special consideration is given to independent students.

**Table A.1 – Parent/Spouse Estimated Tax Rates**

Gross Monthly Income Range	Estimated Tax Rate
\$1 - \$499	0.068
\$500 - \$999	0.073
\$1,000 - \$1,499	0.096
\$1,500 - \$1,999	0.137
\$2,000 - \$2,499	0.169
\$2,500 - \$3,999	0.2
\$4,000 +	0.294

**Table A.2 – Moderate Standard of Living (MSOL)**

Family Size	MSOL
2	\$42,009
3	\$52,154
4	\$59,352
5	\$64,939
6	\$69,496
7	\$73,357
8	\$76,694
9	\$79,641
10	\$82,281

**Table A.3 – Student Pre-Study Estimated Tax Rates**

Gross Monthly Income Range	Estimated Tax Rate
\$1 - \$1,449	0.068
\$1,500 - \$2,999	0.074
\$3,000+	0.096

**Table A.4 – Student Study Period Estimated Tax Rates**

Gross Monthly Income Range	Estimated Tax Rate
\$1 - \$749	0.068
\$750 - \$1,499	0.074
\$1,500 - \$2,249	0.096
\$2,250 - \$2,999	0.137
\$3,000 +	0.165

**Table A.5 – Income Thresholds for Parental Contribution**

Number in Family	Minimum A	Minimum B
2	\$30,000	\$40,000
3	\$35,000	\$47,000
4	\$40,000	\$53,000
5	\$45,000	\$59,000
6	\$48,000	\$64,000
7	\$50,000	\$67,000
8	\$52,000	\$70,000
9	\$54,000	\$73,000
10	\$55,000	\$74,000

**Algorithm A.1. – Estimated Tax on Parental Income**

Let  $X$  be the income for one parent, and  $Tax$  be the estimated tax on that income.

Estimated tax is given by:

If  $(0 \leq X \leq 6000)$

$$Tax = X * 0.068$$

If  $(6000 \leq X \leq 12000)$

$$Tax = X * 0.073$$

If  $(12000 \leq X \leq 18000)$

$$Tax = X * 0.096$$

If  $(18000 \leq X \leq 24000)$

$$Tax = X * 0.137$$

If  $(24000 \leq X \leq 30000)$

$$Tax = X * 0.169$$

If  $(30000 \leq X \leq 48000)$

$$Tax = X * 0.2$$

If  $(X > 48000)$

$$Tax = X * 0.294$$

### Algorithm A.2 – Estimated Tax on Pre-Study Income

Let  $X$  be the pre-study income, and **Tax** be the estimated tax on that income.

If  $(0 \leq X \leq 3000)$

$$\text{Tax} = X * 0.068$$

If  $(3000 \leq X \leq 6000)$

$$\text{Tax} = (X - 3000) * 0.074 + 3000 * 0.068$$

If  $(X > 6000)$

$$\text{Tax} = (X - 6000) * 0.096 + (6000 - 3000) * 0.074 + 3000 * 0.068$$

### Algorithm A.3 – Estimated Tax on Study Period Income

Let  $X$  be the study period income, and  $Tax$  be the estimated tax on that income.

Estimated tax is given by:

If  $(0 \leq X \leq 6000)$

$$\text{Tax} = X * 0.068$$

If  $(6000 \leq X \leq 12000)$

$$\text{Tax} = (X - 6000) * 0.074 + 6000 * 0.068$$

If  $(12000 \leq X \leq 18000)$

$$\text{Tax} = (X - 12000) * 0.096 + (12000 - 6000) * 0.074 + 6000 * 0.068$$

If  $(18000 \leq X \leq 24000)$

$$\text{Tax} = (X - 18000) * 0.137 + (18000 - 12000) * 0.096 + (12000 - 6000) * 0.074 + 6000 * 0.068$$

If  $(X > 24000)$

$$\text{Tax} = (X - 24000) * 0.165 + (24000 - 18000) * 0.137 + (18000 - 12000) * 0.096 + (12000 - 6000) * 0.074 + 6000 * 0.068$$

## Appendix C:

### Entrance Bursary Applicant Survey

**Q1 Do you plan to apply for a loan from the Ontario Student Assistance Program (OSAP) for the 2010-2011 academic year?**

- 1 Yes
- 2 No

**Q2 Will you apply for/receive money from a private loan or a student line of credit from a bank for the 2010-2011 academic year?**

- 1 Yes
- 2 No

**Q3 Will you apply for/receive money from a bursary, grant, or scholarship from a source other than a university or government (e.g. an employer, union, club, or corporation) for the 2010 - 2011 academic year?**

- 1 Yes
- 2 No

**Q4 Why did you apply for a Brock University Entrance Bursary? (Check all that apply)**

- 1 Government student financial aid will not be sufficient to cover my costs.
- 2 I was told I should apply.
- 3 I want to have access to as much funding as possible.
- 4 I was not eligible for government grants or loans.
- 5 I do not know.

**Q5 How would you describe the length of the Brock University Entrance Bursary application?**

- 1 Too short
- 2 Neither too short nor too long
- 3 Too long
- 0 Don't know/not sure

**Q6 How would you describe the level of detail of the Brock University Entrance Bursary application?**

- 1 Not detailed enough
- 2 Appropriately detailed
- 3 Too detailed
- 0 Don't know not sure

**Q7 How would you describe the amount of time it took you to fill out the Brock University Entrance Bursary application (including research)?**

- 1. Not enough time
- 2. An appropriate amount of time
- 3. Too much time
- 4. Don't know/not sure

**Q8 Including time spent on research you needed to do to complete the bursary application, how long did it take to fill out the Brock University Entrance Bursary application?**

- 1 Less than 15 minutes
- 2 15 minutes to just under 30 minutes

- 3 30 minutes to just under 1 hour
- 4 1 hour to just under 3 hours
- 5 3 hours or more

**Q9 What portion(s) of the application took the longest to complete (including time spent on research you needed to do to complete each section)?**

**(Check all that apply)**

- 1 Parental income
- 2 Summer income/ Study period income
- 3 Savings
- 4 Status
- 5 Other Costs

**Q10 Did the Brock University Entrance Bursary application accurately capture your entire financial profile?**

- 1 Yes
- 2 No

**Q11 Were you given sufficient space on the Brock University Entrance Bursary application to provide "other" circumstances that might have significant bearing on your financial profile?**

- 1 Yes
- 2 No

*IF Response to Q1='No':*

**Q12 Why will you not be applying for OSAP? (Check all that apply)**

- 1 The application process for OSAP is too long.
- 2 I already know that I am not eligible for OSAP.
- 3 I do not feel that I will need money from OSAP.
- 4 I do not want to have debt.
- 5 I do not have the necessary financial details to complete the OSAP application.
- 6 I was not aware that I could apply.
- 7 I do not know.

**Q13 If your financial circumstances next year are the same as they are now, will you plan to apply for other institutional bursaries next year?**

- 1 Yes
- 2 No

**If you are willing to be contacted again for related research (a focus group or interview), please provide us with your current phone number and E-mail address. Please note that saying yes now does not oblige you to participate in future research; it just allows us to contact you to inquire about your interest in participating further.**

**Q14 Name:**

**Q15 Phone number:**

**Q16 E-mail:**

