THREE ESSAYS IN PUBLIC ECONOMICS

THREE ESSAYS IN PUBLIC ECONOMICS: CHARITIES AND CHARITABLE GIVING

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Lay Abstract

This thesis explores three topics in the study of charities and charitable giving. I study three sides of the market for charitable donations: the charities that acquire and use funds to provide goods and services, the donors who make donations to the charities and receive incentives from the government for providing these donations, and the government who provides direct grants to charities and provides incentives to donors for giving to charities. The first chapter studies how charities react to government grants. The second chapter studies how managers of a charity can influence the financial outcomes for the charity. The third chapter analyzes how tax incentives provided by the government affects giving behaviour.

Abstract

This thesis explores three topics in the study of charities and charitable giving. The first chapter studies a classic question in public economics which deals with how charities react to government grants. In recent years this question of understanding crowd-out from the charity's perspective has been extended by numerous authors. This chapter is an extension of this work by using the framework from Andreoni, Payne, and Smith (2014) which studied the impact of a specific granting program in the UK. We use a grant program for charities from a Canadian provincial government agency to explore the extent to which these grants crowd out revenue from other sources. We are able to explore more than 15,000 applications by charities for funding over a 10-year period and have constructed a rich data set that captures information about the application and the revenues and expenses of the charity. We demonstrate that the overall revenues of the charity increases approximately 20% and that the effect of the grant extends several years. We also find that the grant raises revenue nearly dollar-for-dollar for small charities and by more than dollar-for-dollar for medium and large charities.

The second chapter further explores how charities operate by studying how managers of charities influence the charity's finances. Using a novel dataset of Canadian charities that links the manager of a charity to the charity's financial data I employ a multi-leveled fixed effects model to estimate the effect the manager of a charity has on the charity's financial outcomes. I find that a one standard deviation increase in manager quality leads to a 0.516 standard deviation increase in total revenue, which amounts to over $500,000, with similar magnitudes for other measures of revenue and expenditures. I then use characteristics of the manager such as gender and marital status to find which characteristics are more prevalent in managers with higher estimated ability. Finally, I present evidence of positive match effects between managers and charities suggesting that good managers are assigned to good charities, and that

the effect of a manager can persist even after the manager leaves the charity.

Finally in the third chapter we explore the extent to which donation decisions are influenced by government policies. Specifically we study the extent to which the salience of a tax-induced incentive for charitable giving influences donors behaviour. Previous academic work has focused on estimating the price elasticity of giving and differences between permanent and transitory effects of changes in the price. This paper focuses on the timing and salience of tax incentives for giving. The Quebec provincial government responded to the January 12, 2010 Haiti Earthquake by permitting donations for the relief effort to be reported on the 2009 tax return. Residents in the rest of Canada reported their donations for Haiti relief efforts on their 2010 tax return. This difference in policy as well as the widespread announcement of the Quebec policy provides a natural experiment for testing whether the timing associated with reporting donations on one's tax return and the salience of the announcement of the policy affects charitable giving. In Canada, all tax filers with a tax liability can benefit from the reporting of donations and the credit available for such donations is tied to the level of the reported donations. We find that Quebec taxpayers gave more than taxpayers in the rest of Canada during this period and that this effect is driven by both an extensive (increased givers) and intensive (increased giving) margin. This result has important policy implications and contributes to current debates on the use of tax incentives to encourage charitable giving.

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APS - Andreoni, Payne and Smith (2014)
CRA - Canada Revenue Agency
FSA - Forward Sortation Area
PAS - Public Appointment Secretariat

Declaration

Chapter 1 is co-authored with Abigail Payne and Chapter 3 is co-authored with Abigail Payne and Ross Hickey. I was fully involved in all aspects of both chapters including developing the idea for the chapter, analyzing the data and writing the chapter.

Introduction

In this thesis I present three essays which explore the economics of charities and charitable giving. In a recent chapter in the handbook of public economics Andreoni and A. A. Payne (2013) note that charities and charitable giving has remained an active and important area of research in public economics. As explained by List (2011) the market of charitable giving has three sides - the charities that acquire and use funds to provide goods and services, the donors who make donations to the charities and receive incentives from the government for providing these donations, and the government who provides direct grants to charities and provides incentives to donors for giving to charities. My thesis adds to the understanding of the interactions between all three players in the market.

The first chapter uses new data to answer a classic question of how charities respond to government grants. We explore the impact that a government grant program has on total revenues for a charity, and examine the extent to which this grant causes other sources of revenue to be crowded-out (or crowded-in). Recent research has suggested that when a charity receives a grant, much of the grant is crowded out, and that most of this crowd-out is because of the charity's response to the grant rather than the donors' response.

We use a grant program from a province in Canada that focuses on funding new programs for charities to examine whether the type of initiatives that the grant funds

affects the level of crowd out. The grant program was founded in 1982 with funding from lottery proceeds to support charities and non-profits involved in social services and community development. The program underwent a large expansion in 1999 that raised their annual budget from $16 million to $100 million. We use data on applications by registered charities from 1999 to 2012 to estimate the effect of receiving a grant on current revenues observed from matching the application information to the charity information returns filed annually with the Canada Revenue Agency. This creates a panel of charities that allows us to follow recipients of the grant, along with those that apply and do not receive the grant, over the periods before and after they receive the grant. Our difference-in-differences framework for evaluation follows that used in Andreoni, A. Payne, and Smith (2014), which studies the effect of a grant program tied to lottery proceeds in the UK.

We find that the grants increase current revenues by about 17% suggesting the grant raises current revenues. We also find that the effect of the grant persists over several years. The estimated overall effect of the grant differs by charity size with the effect being largest for small charities (34%), smaller for medium sized charities (17%) and close to zero for larger charities. We then use the dollar value of the grant and find that the grant is slightly crowded-out for small charities, slightly crowded-in for medium charities and has a strong crowd-in effect for larger charities. These results are very similar to those found by Andreoni, A. Payne, and Smith (2014), suggesting that despite the different settings, charities behave in a similar manner.

In order to understand how charities operate in the market, it is important to understand the factors that affect how they operate. The second chapter explores the extent to which the managers of charities can influence the financial outcomes of the charity which they manage. While works such as Steinberg (1986) have shown that the objective functions of charities vary substantially, little work has explored

the reasons behind this variation. My work contributes to our understanding of the factors that influence how charity's operate by showing that the manager of a charity can substantially impact the charity's finances.

I begin by building a simple theoretical model of how charity managers make financial decisions for the charity based on their abilities that establishes a relationship between a manager's ability and the financial outcomes of the charity. The model shows that when managers care about the quality-adjusted quantity of the charitable good, the manager's quality can be inferred from their influence on financial measures, such as total revenue, for the charity.

One of the obstacles faced by previous studies that attempt to quantify the effect of charity managers is finding data that contains both the identity of the managers and details on the charity's finances. In this chapter I build an innovative dataset that overcomes this obstacle faced by previous studies. Using financial measures collected from tax returns filed by all registered charities in Canada with the Canada Revenue Agency (CRA), I use a sample of charities all belonging to a national organization that allows me to track managers across different charities over time.

To analyze this data I follow previous studies of leadership and use a multi-leveled fixed effects model. I estimate the fixed effect for each manager, and find that a one standard deviation increase in manager quality leads to a 0.516 standard deviation increase in total revenue, which amounts to over $500,000, with similar magnitudes for other sources of revenue and expenditures on programs. Moving beyond the standard analysis I examine which manager characteristics are associated with higher quality managers. I find evidence that both married couples and individuals are effective managers depending on the measure used as the outcome, and find that female managers are of higher quality than male managers for most measures.

I explore the extent to which these results are due to match effects between man-

agers and charities. If better managers are placed at better charities then our baseline estimates may be picking up some of this interaction. When allowing for match effects the results suggest that these match effects are positive for most measures of revenue and expenditures, suggesting that better leaders are placed at better charities.

One can imagine that some of what a manager does could last beyond their tenure at a specific location. This could include securing multi-year government grants or establishing relationships with donors. In a further extension to the standard analysis of leadership, I estimate a model that allows for the effect of the manager to persist beyond their tenure at a given charity. These estimation results suggest that the baseline specification tends to overestimates the effect of the managers for most financial outcomes and highlights the need to take into account the longer-term effect of managers on charity outcomes.

The third chapter looks at the effect that tax incentives from the government has on individuals' decisions to donate. While previous research has focused on measuring the permanent and transitory effects of a change in the tax price of giving on gifts to charities (Randolph (1995) and Auten, Sieg, and Clotfelter (2002)), we focus on the effect on giving behaviour of the timing between when a gift is made and when it is reported on a tax return.

We study the sensitivity of charitable giving to the salience and timing of tax incentives by exploiting a natural experiment after the Haiti earthquake of 2010. The earthquake occurred on January 12th, near the time when taxpayers in Canada begin preparing their tax returns for income earned in the previous year. Under other circumstances, all donations to support the relief efforts would be reported one year later, when filing the 2010 tax return in April 2011. One province, Quebec, changed this practice and announced that tax filers could report their donations in support of the relief efforts on their 2009 tax return, effectively changing the timing of reaping

the benefits of the credit as well as increasing the awareness that the donations could be reported on one's tax return, especially at the time when most individuals were preparing their returns. This created a difference in the treatment of donations by those residing in Quebec and those residing in the rest of Canada.

In addition to changing the timing of the reporting of donations, Quebec's policy increased the visibility, or salience, of the tax credit since through advertising the earlier credit, the government is also advertising that there is a tax credit for donations. Moreover, unlike the US where the tax benefits for donations are tied to itemizing deductions, tax credits for giving are available to all Canadian tax filers provided they incur a tax liability. The value of the credit is tied to the level of the donation, not the tax bracket of the taxpayer.

We find that the Quebec incentive had a meaningful effect on all measures of donation activity. The incentive increased the share of households reporting a charitable donation by 2 percentage points. For the 2008 tax year, approximately 25% of Canadian tax filers reported donations on their tax return. We also find that the average donation per donating household increased by 7 to 9 percentage points. These results point to an increase in reported giving along both intensive and extensive margins.

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Chapter 1

Digging Into Crowd Out - The Impact of Government Funded New Charity Initiatives

1.1 Introduction

When a charity receives government funding do total revenues increase? Does the charity undo the benefits of the funding by changing its behaviour for the collection of revenues from other sources (such as fundraising) or do donors change their behaviour? Granting agencies may be concerned that the effect of their grant may be lessened if either the charity or donors change their behaviour in response to this grant in a way that causes total revenue to rise by less than the amount of the grant. Recent research has suggested that much of the grant is crowded out, but that this crowd out is not complete and that most of the crowd out is due to reduced fundraising by the charity (see Andreoni and A. A. Payne (2003), Andreoni and A. A. Payne (2011), Andreoni and A. A. Payne (2013), and Andreoni, A. Payne, and Smith (2014)). Can

granting agencies change the structure of their granting program in order to ensure that their grants are not crowded out? It may be that certain types of grants, such as those that establish new initiatives as opposed to those that fund existing programs may lead to different levels of crowd out.

This paper studies the effects of receiving a grant under a program by a provincially funded foundation on private and public revenues to the recipient charities operating in Ontario, Canada. This papers follows Andreoni, A. Payne, and Smith (2014), a study that examined the effects of a UK lottery grant program. Similar to the UK program, the Ontario foundation initially received its funding as part of a distribution of proceeds from a provincially run lottery. The foundation was created in 1982 and was given a mission to support activities of charities and non-profits involved in social services and community development to "build healthy and vibrant communities throughout Ontario" (Ontario Trillium Foundation (2016b)). Initially the annual amount of funding provided to the foundation was approximately $16 million per year and the grant recipients were human and social service based organizations. The funding program was restructured in 1999 and the provincial funds allocated to the foundation were substantially increased ($100 million per year of funding). Although the focus of the programs operated by the foundation continues to focus on the building and support of vibrant communities, charities and non-profits from a broader group of services became eligible to apply for the funding.

Initially the annual amount of funding allocated was low (around $16 million per year) and funding was restricted to organizations providing human and social services. The fund as it is known today, however, was re-designed in 1999. The redesign included making the funding less tied to lottery proceeds, expanding the annual funding to the agency, to over $100 million and expanding the scope of charities and community based organizations eligible to apply.

We study the effects of the grant decisions for the period 1999 to 2012 under the community program. This funding was allocated based on the review of an application by a local committee and approved by the provincial committee. The foundation divided the province into 16 catchment areas that were based on geographical and municipality boundaries. Our study covers those applications by single applicant registered charities with whom we have been able to match with data from their Canada Revenue Agency information return. These data capture the revenues and expenses of the charities on an annual basis, allowing us to explore the effect of the foundation grant on total revenues from private and public sources (excluding capital gains from investments) to examine the extent to which the grant increased the operations of the charity as well as the level of persistent effects of the grant.

The effects of the foundation grants on charity revenues are strikingly similar to those found for Andreoni, A. Payne, and Smith (2014). We find that the grants increase total revenues by about 17% in the first year of funding and there continues to be growth in total revenues in subsequent years. This growth is observed for all sizes of charities except those with revenues that are greater than $500,000. How does this growth in revenues relate to the notion of crowd-out? If we explore the effect of the grant on one year of funding then we would conclude that the grant crowds out other revenue. A one dollar increase attributable to the foundation grant only increases total revenues by approximately 33 cents for small and medium sized charities. Over a three year period, however, there is an increase in total revenues that remains less than $1 for small charities (about 86 cents) but gets closer to $1 if we study the effect over a five year period (about $1.01). For medium-sized charities, we do not observe any crowd-out over a three year period (a $1 increase in grants results in an $1.12 increase in total revenues) and some crowd-in in the effect over a five year period (about $1.54 increase in total revenues). For larger charities, our estimates are imprecise suggesting

that the foundation grant had relatively little impact on increasing revenues. This in part may attributable to the fact that the size of the grants to these charities, on average, represent a low proportion of their overall revenues.

The paper proceeds as follows: section 1.2 describes the funding program and discusses the importance of studying specific granting programs to understand better issues around crowd-out. Section 1.3 describes the data set and presents summary statistics. Section 1.4 presents the analysis for the overall effect of the grant and section 1.5 tests for crowd-in or crowd-out. Section 1.6 discusses threats to identification and section 1.7 compares our results to those of Andreoni, A. Payne, and Smith (2014). Finally section 1.8 concludes.

1.2 Description of Program Under Study

The granting foundation under study is one that was initially created as an arms-length foundation in 1982. Like many states in the US and other countries, the province created a provincially administered lottery. A fraction of the proceeds from the lottery were used to establish the Ontario Trillium Foundation whose mission was to distribute the funding to charities and non-profits across Ontario to promote the development of vibrant communities Ontario Trillium Foundation (2016b). The budget for the foundation in the early years was small and the grants were distributed to organizations primarily focused on the delivery of human and social services. In 1999 the funding and the organization of the foundation dramatically as the funding increased to approximately $100 million per year and the types of organizations eligible to receive funding were expanded to include those providing services in the areas of arts & culture, the environment, and sports & recreation. Also during this expansion, the link to lottery proceeds diminished and instead the foundation was funded from

general provincial revenues, while continuing to be an arms-length relationship with the province Ontario Trillium Foundation (2016a).

Applications for funding to the foundation typically are considered under one of two main programs: community grants and province-wide grants. The province-wide program is for initiatives with a broad geographic focus, usually defined as covering three or more catchment areas. In 2009 the future fund program was introduced within the province-wide program to provide grants for proposals that meet the current strategic focus, which are defined by the board of directors of the granting foundation and can change on an annual basis. The community grants program funds initiatives with a clear and measurable impact on the local community and accounts for nearly 85% of all applications. The community grants program targets new initiatives by charities and non-profit organizations[1] engaged in community oriented activities tied to services in the arts & culture, social & human services, sports & recreation, and the environment. The applications can be from a single or multiple organizations. This study focuses on single charity applicants to the community program, given the ability to link information on applications to detailed financial information retrieved from the organization's information return filed with the Canada Revenue Agency.

The community grant program is administered by the local grant review teams from each of the 16 catchment areas. Volunteers wishing to apply for their local grant review team submit an application through the Public Appointment Secretariat (PAS). The PAS maintains a list of candidates for each catchment area and as vacancies arise qualified candidates are considered for appointment to the grant review team Ontario Trillium Foundation (2011). For each catchment area a foundation staff member oversees the collection and evaluation of the applications. The review team is comprised of 18 to 25 members that serve as volunteers and are appointed

[1]This can include community groups such as library boards and small municipal governments.

from the local area and typically serve a renewable term that ranges from one to three years.

Each application is assigned to one of 16 grant catchment areas based on the location of the proposed service provision. Until 2003, applications were accepted and evaluated on an ongoing basis in all catchment areas. Between 2004 and 2005, the process switched to one where an application deadline was imposed and the evaluations of the proposals were structured around these deadlines. By 2005, the foundation had converted to a process whereby applications are evaluated three times per year. The submission deadlines are March 1, July 1 and November 1.

To apply, a non-profit or charity must complete a standard application form. While the form has changed over time, it has generally included a description of the project, the level of funding requested, the length of the project, whether financial support is sought for operating and/or capital expenditures, and key information about the charity including financial statements, number of volunteers and staff, and the types of services that the charity provides.

The review of applications follows a set process followed by each catchment area. Applications are first screened for basic eligibility criteria. This screening filters out applications who are either not eligible for funding or whose project does not fit the priorities of the grant program.[2] Projects with a request of greater than $100,000 are given a more thorough examination that may include onsite visits from staff. Staff compile all of the information from the applications and subsequent research and present a recommendation of either approval or rejection to the grant review team. The grant review team then meets to review the applications and to submit their recommendations. As the funding pot is fixed, the review team assists in deciding

[2]It is unusual for an application to be screened out for not meeting the criteria of the grant program since the types of programs funded is very broad.

which applicants should be funded and which ones should not be funded. These decisions are then finalized by the foundation's board of directors.

These grants are for specific programs and are typically programs which extend or expand an organization's operations. Thus, unlike a grant that supports the organization's general operations, we should query whether the organization and/or donor reaction to learning about the receipt of a grant would be the same as it might be for grants that support the general operations of the organization. Similar to Andreoni, A. Payne, and Smith (2014), the foundation funding program under study allows us to study a relatively homogeneous set of organizations as well as utilize an identification strategy that focuses on studying organizations that apply for the funding versus just any organization.

This granting program in particular is interesting to study for a number of reasons. First, the granting program is very large, with total annual grants over $100 million dollars. This provides a broad set of charities that apply and receive the grant, allowing us to create an expansive dataset. Second, the granting foundation is well known and may result in a positive signal to donors about the quality of the charity - this may cause crowd-in of other sources of revenue (Vesterlund (2003), Andreoni and A. A. Payne (2003) and Andreoni (2006)). Third, and perhaps most important, we are able to observe information about all charities that apply for the grant, including those who do not receive a grant. Similar to Andreoni, A. Payne, and Smith (2014), we observe information about charities before and after they apply and so can compare charities that are successful with charities that are unsuccessful.

1.3 Data and Summary Statistics

We use information on applications to the grant from the time of the restructuring of the program in 1999 to 2012. The applications to the granting agency fall under two program, the province-wide program and the community program. Figure 1.1 depicts the total amount requested and funded for each program over the sample period. Comparing the two grant programs, we see that both the amounts requested and the amounts funded are greater for the community based programs. In terms of the overall amounts funded, in most years, the level of funding awarded under the community based programs is approximately four times the amount awarded for province wide funding.

Our analysis focuses on the applications and awards under the community program because it represents the majority of the grants and is aimed at initiatives affecting the local community. The grants under these programs can be administered by registered charities or non-profit organizations. The distinction between these two types of organizations is that the registered charity is subject to greater scrutiny by the CRA and it may issue tax receipts for donations. In addition, the grants can fund programs administered by a single organization or multiple organizations. Figure 1.2 depicts the number of applications to the community program, grouped into those submitted by single charities, single non-profits, and by groups of organizations (charities and/or non-profits). In the first few years the bulk of the applications were from charities, but in recent years applications from non-profits have risen

As our analysis focuses on the registered charities for which we can match to the CRA information return data, the remainder of the analysis will focus on applications by these organizations. Table 1.1 reports key information about the number of applications and the charities under study. We group the charities into three year intervals

except for the last two years for ease of presentation. Note that the information for 2012, our last year of applications captures the information from 2 of the applications cycles. In the first two columns we report the number of applications and the share that were successful. Overall, the number of applications has not varied dramatically over the sample period. The success rate of the applicants, however, has varied. In the earlier periods, nearly 80% of the applicants were successful. In the later periods, the success has dropped with the success rate falling to below 50% in the last year of our study. In columns 3 and 4, we report the total amount of funding requested and awarded for each period. For the most part, looking at just the requests for this subset of organizations it is clear there are far more projects pitched than can be funded by the foundation. Moreover, despite relatively high success rates, the amount of funding awarded is much less than the amount requested. Overall, the requests range from a few thousands of dollars to well over one million dollars. In columns 5 and 6 we report the statistics for the median amounts that were requested and awarded, respectively. Overall, the requested amount at the median is around $80,000 but the median awarded amount is around $55,000. In any given year the maximum awarded under the community program is under $500,000. Looking across the successful applications, we observe that on average the amount awarded is 91% of the amount requested.

Figure 1.3 depicts the distribution of applications by catchment area for the charities we study applying to the community program. We have ordered the areas based on the approximate total population for that area. The largest population is Toronto - and not too surprisingly this is the area with the greatest share of applications. As we move across the areas, however, population size and number of applications is not as strongly correlated as one might expect. The Ottawa catchment area stands out with a large proportion of applications coming from charities in that catchment

area, as does the Niagara catchment area with a relatively small proportion of applications coming from that area. However, the overall trend is that the proportion of applications from each region falls as population decreases.

Figure 1.4 reports the distribution of awards by catchment area for the sample period. Not surprisingly, the awards for each catchment area follows a similar pattern to Figure 1.3. Again, similar to the share of applications by region, the general trend is that those catchment areas with higher populations have a higher number of awards.

Thus far we have treated the applications as independent. It is not uncommon, however, for a charity to apply for funding more than once. Table 1.2 Panel A reports the distribution of applications based on the number of times for which a charity has applied for funding. Approximately 50% of the 4,789 charities in our sample apply for funding only once during the sample period. Approximately 91% of the charities apply for funding 3 or fewer times. In columns 4 and 5 we report the share of the charities grouped by number of applications that are observed being awarded once (column 3) or more than once (column 4). While a few charities are successful in obtaining more than one award, nearly two-thirds of charities do not receive an award or receive only one.

Table 1.2 Panel B explores further the number of awards per charity as well as the average gap between the end of one award and the start of the next. Overall, approximately 26% of the charities never receive an award and 40% of the charities receive only one award. While there are a few outliers, most charities receive 3 or fewer awards. An aspect of the granting program is that there is an emphasis placed on supporting new initiatives. Awards are typically not provided for supporting simply the operational expenses of the charity. Thus, for the most part, if a charity receives more than one award, it is for different programs and not a continuation of an existing program. Given the average gap between the end of one award and the start of the

next award is 30 months, the data support this notion that charities receiving multiple awards are introducing separate programs.

Table 1.2 shows the range of number of applications and grants by charities. Of the 4,789 charities that apply, 50% only apply once, while 77% apply two or fewer times over the 14-year period we study. From the charities that apply, 1,223 (26%) never receive a grant. Another 41% receive only 1 grant, while only 13.9% of the charities receive more than 2 grants. This suggests that for the majority of charities the program is used as a one-time source of funding, rather than a continual source of funding. This is also evidenced by the fact that of the 6,116 awards, 58% are for only 1 year of funding, as shown in Panel C of Table 1.2. Only a small minority (2.8%) of awards are for longer than 3 years. Table 1.2 also shows that there is a significant gap between the grants for charities; even for the charities with a large number of grants average nearly a year between the end of a grant and the beginning of another grant.

Table 1.3 gives details about the grant requests, grant awards, and total revenue of the charities that apply for funding. Our total revenue measure comes from the information return filed by each charity with the CRA on an annual basis. We are able to link this information return with the applications for each charity that applies for funding. First looking at all charities we see that the mean amount requested is similar for those that are awarded funding ($116,000) and those that are rejected ($121,900) but that the standard deviation is almost three times as large for the rejected charities. We can also see that the mean total revenue is almost 20% larger for those that are awarded funding versus those that are rejected, as is mean government revenue and mean private giving. From the next columns we see the summary statistics broken down by the size of the charity, where the size is determined by the mean total revenue for the entire period, with small charities averaging less than $100,000, medium charities between $100,000 and $500,000, and large charities greater than

$500,000. Not surprisingly, both the mean amount requested and the mean amount of funding received is smallest for small charities and largest for large charities. It's also important to note that the size of the grant request as a percentage of overall revenue is much larger for small charities than for large charities, with the average amount requested for small charities actually being larger than the mean total revenue for all small charities.

In addition to matching this information to the CRA information return data we match in information on the characteristics of the neighbourhood in which the charity operates based on socio-demographic measures from the 1996, 2001, 2006, and 2011 censuses. To properly reflect the neighborhood in which the charities operate we use the forward sortation area (FSA) as our level of geography. The forward sortation area is defined by the first three digits of the postal code and represents approximately 8,000 households. We feel that the FSA is an appropriate geography to use for the neighbourhoods in which the charity operates in our study since most charities are community based and likely operate within this type of geography. The measures we use from the census includes the average household income, total population, measures to capture the age distribution, and the percent of the population who are immigrants. We pick these measures to help control for the environment in which the charity operates, both from the perspective of where potential funding sources may arise as well as to help control for the differential needs of the communities which may influence the types of goods and services the charities provide.

1.4 Overall Effect of the Grant

As a first step to estimate the effects of the grant on total revenue we present Figure 1.5 which shows the year over year change for charities that apply for a grant

in year t for both the charities that receive the grant and those that do not. We can see that the charities that receive the grant see a rise in total revenue and that the charities that do not receive the grant see flat revenues, giving evidence that the grant raises total revenue.

While Figure 1.5 provides evidence of a positive effect of the grant on total revenue for the charity, there may be other factors affecting the charities that are not controlled for when looking at raw differences. To control for this, we move to a regression framework to test whether being awarded a grant has an effect on total current revenue in the period following the grant. We first focus on the overall effect of the grant on total revenue and follow the empirical framework from APS by estimating a difference-in-differences model:

$$y_{it} = \alpha_i + \lambda_t + \beta \text{Post}_{it} + \delta \text{Award}_{it} + \theta \text{Controls}_{it} + \epsilon_{it} \tag{1.1}$$

where y_{it} is log total revenue, α_i and λ_t are charity fixed effects and year fixed effects respectively, Post is a dummy for the period after a charity applies for all charities that apply (with the period either three or five years), Award is a dummy equal to one for the period following the award for charities that are awarded a grant (again either three or five-year period) and the controls include neighbourhood characteristics such as average household income, percent of the population who are immigrants and measures of the age distribution.[3] β will measure the effect on the outcome for all charities after the application. Our main parameter of interest is δ which will measure the effect on the outcome for charities who are awarded the grants. The amount of crowd-out will be seen in the value of δ; if $\delta = 0$ then there is complete crowd of the grant, if $\delta > 0$ then the grant raises total revenue.

[3]We use three and five-year periods to follow APS.

Table 1.4 presents the results for this specification. Column 1 shows that over a three-year period the grant increases total revenue by nearly 19%. From column 3 we see that the effect of the grant over a five-year period is slightly smaller at 17%. From Table 1.3 we saw that there were large differences in the size of the grant relative to total revenues for charities of different sizes, so we might expect the grant to affect charities differently depending on their size. Columns 5, 7 and 9 show the overall effect of the grant for small, medium and large charities respectively. We find that the effect is strongest for small charities, with the grant raising total revenues by 33.9% over a five-year period. For medium-sized charities we still see a positive effect of the grant, with the total revenues rising 16.8% over the five-year period. The effect for large charities is essentially zero. These findings are not surprising, since from Table 1.3 we saw that even though larger charities received larger grants on average than smaller charities, the size of the grant as a percent of total revenue was much smaller for large charities. These show that the grant raises total revenue in the period following the grant for small and medium charities, but that it appears the grant is crowded-out for large charities.

By using the specification in (1.1) we capture the overall effect of the grant over the whole post-grant period. However, this fails to capture any year-over-year differences in the effect of the grant on total revenue. If total revenue only rises in the year immediately after the grant it may suggest that it is only the grant causing the rise in total revenue. However, if the effect of the grant is seen in years following the grant then it may suggest that the grant has a persistent effect on total revenue. To capture year-over-year differences we estimate a separate specification where rather than have one dummy for the entire period after the application (three or five years) we use separate dummies for each year:

$$y_{it} = \alpha_i + \lambda_t + \beta_s \sum_{s=0}^{2or4} \text{Post}_{i(t+s)} + \delta \sum_{s=0}^{2or4} \text{Award}_{i(t+s)} + \theta \text{Controls}_{it} + \epsilon_{it} \tag{1.2}$$

To test for crowd-out in the previous specification we tested whether the parameter associated with the indicator for the post-grant period. Here, we test for crowd out using the sum of the δ_s, whether it be for three or five years. This specification also allows us to test for the persistence of the effect of grant. The results are reported in Table 1.4. First looking at the three-year effect in column 2, the total revenue rises 22.8% in the first year, with a 18.5% rise in the second year and an 8.2% increase in the third year. This persistence in the effect of the grant is likely only partly due to grants being paid out over multiple years, as 58% of grants are paid out in a single year. Using the five-year specification, we see that the pattern is similar to the three-year, with a positive effect in the first year (25.3%) which then slowly falls off over time but remains positive and statistically significant.

We next look at the year-over-year effect for each charity size group. Column 6 shows the effect of the grant by year for small charities. The effects are much larger than we saw for all charities, with a rise in total revenue of 53% in the first year after the grant for small charities. The effect of the grant in the second year is similarly high at 36%, and from years three to five the effects are similar to those for all charities. For medium charities the effect is very similar to those for all charities. Finally, for large charities, the effects are small and positive, but statistically insignificant. Overall this provides evidence that the grant has a persistent effect on total revenues for small and medium charities, but that the grant has no effect on total revenue for large charities.

1.5 Crowd-in or crowd-out

The previous section gave evidence that the grant had a positive effect on total revenue for small and medium charities and was completely crowded-out for large charities. What it failed to capture, however, was whether the grant increases total revenue dollar-for-dollar or by some other amount. If the grant increases the charities revenues by less than dollar-for-dollar then the granting foundation may be concerned that the full impact of their grant isn't being realized by the charities. If the grant causes total revenues to increase by more than the amount of the grant, then the granting foundation needs to take into account the positive externality that the grant creates for the charities when it makes funding decisions. To test for the level of crowd-out or crowd-in we use the actual dollar value of the grant in our analysis using the following specification:

$$y_{it} = \alpha_i + \lambda_t + \beta_s \sum_{s=0}^{2or4} \text{Post}_{i(t+s)} + \delta_{it} \sum_{s=0}^{2or4} \text{Award}_{i(t+s)} * \text{Amount}_{it} + \theta \text{Controls}_{it} + \epsilon_{it} \quad (1.3)$$

where everything is the same as in (1.2) except y_{it} is now measured in levels and Amount represents the total amount of the grant that the charity receives. This allows us to test the level of crowd out observed over a 3-year period. If $\delta_0+\delta_1+\delta_2+\delta_3+\delta_4 = 0$ that would indicate total crowd out, $0 < \delta_0 + \delta_1 + \delta_2 + \delta_3 + \delta_4 < 1$ would indicate partial crowd out, $\delta_0 + \delta_1 + \delta_2 + \delta_3 + \delta_4 = 1$ would mean the grant is neutral (raises total revenue dollar for dollar), and $\delta_0 + \delta_1 + \delta_2 + \delta_3 + \delta_4 > 1$ would mean crowd-in.

Table 1.5 presents the results for the effect of the grant over a five-year period, with the coefficients representing the effect of each dollar of the grant on total revenue. First focussing on all charities, from column 1 we can see that in the first year of funding,

one dollar of grant money raises total revenue by 38 cents, but that this effect is not statistically different from zero. However, for years two through five, one dollar of grant raises total revenue by around one dollar in each year. Turning to the sum of the effect of each dollar of the grant over a three-year period we see that one dollar from the grant raises total revenue by $2.63 which gives evidence of crowd-in from other sources. Over five years, each dollar from the grant raises total revenue by nearly $5.

Similar to the previous section, we may expect the effect to differ by the size of the charity. Columns 2-4 show the effect of each dollar of the grant by the size of the charity. For small charities, over the three-year period, one dollar from the grant raises total revenue by 86 cents, suggesting a small amount of crowd-out over the three-year period. When we move to a five-year period, one dollar of grant raises total revenue by $1.01 which means that the grant is neutral over the five-year period. The effect of each dollar of the grant grows as the size of the charity grows. For medium-sized charities we see essentially a dollar for dollar increase in total revenue over a three-year period, while over a five-year period one dollar from the grant raises total revenue by $1.54. Finally, for large charities one dollar from the grant raises total revenue by $3.91 over a three-year period and by $7.01 over a five-year period.

These results show that the effect of the grant varies by the size of the charity. There is some evidence of crowd-out for grants to small charities over a three-year period but the grant appears to be neutral over a five-year period. For medium and large charities, we see evidence of crowd-in from other sources. The patterns for charity sizes appear to be starkly different whether we test for the overall effect of the grant, or the dollar value of the grant. The overall effect of the grant was strongest for small charities and weakest for large charities, while the dollar impact was strongest for large charities and weakest charities. These differences come from the fact that for large charities, the size of the grant relative to their overall revenues is so small

that the overall effect of the grant on total revenue is positive but not statistically different from zero.

1.6 Threats to Identification

When using difference-in-differences one of the key assumptions is that absent the treatment, both the treatment and control groups would have similar outcomes. This assumption means that differences we observe post-outcome are entirely due to the treatment. In our case, this means that charities that receive the grant would otherwise have the same outcomes as the charities that do not receive the grant had they not received the grant. We may be concerned that because charities are not randomly allocated to these grants then there may be some underlying attribute of the charity that affects both their likelihood of receiving the grant and their future streams of revenue. If charities that receive the grant would have seen faster growth in total revenue even if they did not receive the grant, then our estimation will attribute this growth in revenue to the receipt of the grant and this may overstate our estimate of the effect of the grant. We propose two ways for future work that help to overcome this potential issue.

Our first approach is to trim the sample of charities so that we are studying a more homogeneous set of charities who we propose would be more likely to have similar growth in revenue absent the grant. Ideally we would like to compare charities who just missed the funding cut-off on both sides - those that barely made the cut-off for funding and those that barely missed being awarded a grant. However, the information we receive from the granting agency does not include any scores from the evaluation of the applications by the granting committee. Instead we can use the information from the charity's applications and information about the committee

making the grant decision to estimate the likelihood of receiving the grant. Once we have the estimated likelihood of receiving the grant, we can use this to construct a sample of charities that are all in the same range for the probability of receiving a grant. This group will allow us to conduct the analysis for this group that are equally likely to receive the grant.

One potential issue with this approach is if there is a factor that affects the likelihood that a charity receives a grant that we do not observe. This would cause our estimates to be biased and may mean that our sample of charities is not as homogeneous as we wish. Our second approach is to instrument for the funding decision. This will capture reasons why the charity might get funded or not that is not related to the charity's post-grant performance. Instruments that involve committee composition can help capture which charities get funding or not due to preferences of the committee which may not be as directly tied to the quality of the charity. This will give us a more accurate estimate of the effect of the grant. Our data from the granting program contains information on the members that have served on the selection committees. For each catchment area, the names of the members are provided and from this we constructed measures to reflect the composition of the committee based on the number of members and the tenure of each member serving. We can use these measures as instruments for the funding decision.

1.7 Discussion

Since our study closely follows Andreoni, Payne and Smith (2014), in this section we compare our results to their findings. Panel A of Table 1.6 presents the estimates of the overall effect of the grant from both studies. APS finds the grant increase total revenue by 22.2% which is close to our finding that the grant increases total revenue

by 17.0%. The pattern is similar in both studies with the effect largest for small charities (APS 40.4%, our study 33.9%), slightly smaller in magnitude for medium charities (APS 18.4%, our study 16.8%) and even smaller and insignificant for large charities (APS 4.3%, our study 0%).

Panel B shows similar patterns when accounting for the size of the grant. The effect of each dollar (or pound) of the grant is largest for small charities, and is also largest in the first three years after the grant, with smaller (and sometimes insignificant) values for the fourth and fifth year after the grant is awarded. Testing for crowd-out or crowd-in reveals very similar patterns in both papers. The five-year sum of the effect of the grant for small charities reveals nearly a dollar-for-dollar (or pound-for-pound) increase in total revenue for small charities, while for medium charities show around a $1.54 (1.64 for APS) increase in total revenue for each dollar (pound) of grant over a five-year period.

Our study focuses on a provincially run grant program in a single province in Canada, while APS uses a national grant program in the UK. Despite the differences in both the scope of the grant program, and the country in which the grant program takes place, we find remarkably similar results. Both studies show that the grant increases total revenue for charities, with the grant being revenue neutral for small charities, and the grant crowding-in revenue from other sources for medium charities. This provides evidence that charities from different countries behave in a similar manner in their response to government run grant programs.

1.8 Conclusion

We use a grant program from a province in Canada to examine the effect of a grant on a charity's total current revenue. We find that the grants increase current

revenues by 17% suggesting the grant raises current revenues and does not crowd-out other sources of revenue. We also find that the effect of the grant persists over several years. The estimated effects differ by charity size with the effect being largest for small charities (34%), slightly smaller for medium sized charities (17%) and close to zero for larger charities. We then use the dollar value of the grant and find that the grant is slightly crowded-out for small charities, slightly crowded-in for medium charities and has a strong crowd-in effect for larger charities.

In future work we will use our rich dataset to examine how each source of revenue is affected by the grant. Our results suggest that there is some crowding-in of other sources for medium and large charities, and this detailed dataset will let us examine which sources are crowded-in.

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Table 1.1: Applications and Funding by Period

Period of Funding	Number of Applications (1)	Share of Successful Applications (2)	Total Requested ($Millions) (3)	Total Awarded ($Millions) (4)	Median Amount Requested ($1000) (5)	Median Amount Awarded ($1000) (6)
1999-2001	1,811	79.1%	$232.0	$113.0	$84.7	$57.4
2002-2004	1,898	78.6%	$217.0	$111.7	$84.2	$53.3
2005-2007	2,187	61.3%	$244.9	$95.1	$77.0	$54.6
2008-2010	1,906	69.3%	$214.3	$97.6	$71.1	$54.3
2011	671	53.9%	$89.3	$29.7	$78.3	$62.8
2012	385	43.6%	$46.0	$13.4	$73.6	$61.4
All Years	8,858	69.0%	$1,043.5	$460.5	$77.3	$55.3

Notes: These numbers reflect applications by single organization charities submitted to the community program. All dollars are reported in 2012 dollars. Data for 2012 reflects 2 cycles of applicants.

Table 1.2: Number of Awards and Applications

Panel A: Distribution of Charities by Number of Applications

# of Applications	# Charities	% of Charities	% of Charities with 1+ awards	% of Charities with 2+ awards
	(1)	(2)	(3)	(4)
1 Application	2,391	49.9%	59.4%	
2 Applications	1,297	27.1%	84.4%	52.4%
3 Applications	689	14.4%	93.5%	80.0%
4 Applications	295	6.2%	97.6%	91.5%
5 Applications	81	1.7%	98.8%	90.1%
6 Applications	31	0.6%	100.0%	100.0%
7 Applications	5	0.1%	100.0%	100.0%
Total # of Charities	4,789	100.0%	74.2%	33.7%

Panel B: Number of Awards and Time between Awards

# of Grants	# charities	% of Charities	Average # of months between end of 1st grant & start of 2nd grant
	(1)	(2)	(3)
No Grants	1,234	25.8%	
1 Grant	1941	40.5%	
2 Grants	949	19.8%	35.3
3 Grants	450	9.4%	26.7
4 Grants	163	3.4%	19.4
5 Grants	39	0.8%	16.3
6 Grants	11	0.2%	11.5
7 Grants	2	0.0%	7.0

Panel C: Length of Awards

# of Years Funded	# Awards	% of Awards
	(1)	(2)
1 Year	3,558	58.1%
2 Years	1,244	20.3%
3 Years	1,146	18.7%
4 Years	86	1.4%
5 Years	87	1.4%
Total # of Awards	6,116	

Notes: The number of months between the end of one award and start of another is calculated by the authors, using the decision dates for consecutive awards and the length of the grant.

Table 1.3: Sources of Funding for Charities

	All Charities			Small Charities		Medium Charities		Large Charities	
	All	Awarded Funding	Rejected	All	Awarded Funding	All	Awarded Funding	All	Awarded Funding
	62,706	6,120	2,681	25,446	2,091	21,263	2,233	15,997	1,796
Mean Requested Funding	117.8	116.0	121.9	78.5	70.4	123.0	118.4	167.5	167.7
(standard deviation)	(182.3)	(121.5)	(272.8)	(229.8)	(76.7)	(133.2)	(121.8)	(145.6)	(142.1)
Mean Funding Received if Successful		75.3			44.4		77.0		110.4
(standard deviation)		(67.9)			(38.9)		(63.5)		(81.9)
Mean Total Revenue	673.6	712.1	574.7	37.2	55.7	244.6	262.7	2,281.7	2,062.2
(standard deviation)	(1915.9)	(1472.8)	(1467.5)	(42.3)	(49.0)	(188.4)	(179.9)	(3317.0)	(2204.4)

Notes: All values in real 2012 dollars.

Table 1.4: Results for Effect of Being Awarded Funding on Log Total Revenue

	Three Years		Five Years							
	All Charities		All Charities		Small Charities		Medium Charities		Large Charities	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Awarded Funding	0.187***		0.170***		0.339***		0.168***		0.000	
	(0.017)		(0.017)		(0.030)		(0.027)		(0.027)	
Awarded Funding t=0		0.228***		0.253***		0.530***		0.178***		0.000
		(0.019)		(0.019)		(0.034)		(0.030)		(0.031)
Awarded Funding t=1		0.185***		0.215***		0.360***		0.202***		0.020
		(0.019)		(0.019)		(0.035)		(0.030)		(0.031)
Awarded Funding t=2		0.082***		0.122***		0.165***		0.142***		0.017
		(0.019)		(0.019)		(0.034)		(0.031)		(0.032)
Awarded Funding t=3				0.076***		0.069**		0.107***		0.011
				(0.019)		(0.034)		(0.031)		(0.034)
Awarded Funding t=4				0.052***		0.052		0.084***		-0.006
				(0.019)		(0.034)		(0.031)		(0.034)
Number of Obs	62,885	62,885	62,885	62,885	25,814	25,814	21,198	21,198	15,873	15,873

Notes: * p¡0.1, ** p¡0.05, *** p¡0.01. The measure awarded funding is a dummy variable that is equal to 1 for the first three (column 1) or five (columns 3, 5, 7 9) years of being awarded a grant from the foundation. The measure "Awarded Funding t=X" is a dummy variable equal to one for that particular year. T=0 represents the year the grant is awarded and is first observed in the charity's information return. Coefficients represent the percent increase in revenue from being awarded a grant. Small charities defined as having less than $100,000 in average total revenue, medium charities between $100,000 and $500,000 and large charities over $500,000. Charity and year fixed effects are included. Neighbourhood controls are household income, percent immigrants, and a percent of population between 0-19, 55-64 and 65+ respectively. Meeting date dummies are constructed for the largest meeting dates, where dates between large meeting dates are assigned to the closest large meeting date.

Table 1.5: Effect of Grant Amount on Total Revenue

	All Charities	Small Charities	Medium Charities	Large Charities
	(1)	(2)	(3)	(4)
Awarded Funding t=0 x Amount	0.380	0.333***	0.322***	0.568
	(0.322)	(0.026)	(0.053)	(0.602)
Awarded Funding t=1 x Amount	1.336**	0.330***	0.428***	2.118*
	(0.573)	(0.024)	(0.055)	(1.141)
Awarded Funding t=2 x Amount	0.912***	0.199***	0.368***	1.228**
	(0.271)	(0.023)	(0.063)	(0.537)
Awarded Funding t=3 x Amount	1.111***	0.098***	0.249***	1.409***
	(0.267)	(0.023)	(0.057)	(0.510)
Awarded Funding t=4 x Amount	1.259***	0.052**	0.175***	1.687***
	(0.308)	(0.022)	(0.057)	(0.572)
Sum of 3 years	2.628	0.862	1.118	3.914
p-value, test = 1	(0.085)	(0.021)	(0.427)	(0.127)
Sum of 5 years	4.998	1.012	1.542	7.010
p-value, test = 1	(0.003)	(0.892)	(0.017)	(0.029)
Number of Observations	62,885	25,814	21,198	15,873

Notes: * p¡0.1, ** p¡0.05, *** p¡0.01. Coefficients represent the increase in total revenue for each dollar of grant awarded. Small charities defined as having less than $100,000 in average total revenue, medium charities between $100,000 and $500,000 and large charities over $500,000. Charity and year fixed effects are included. Neighbourhood controls are household income, percent immigrants, and a percent of population between 0-19, 55-64 and 65+ respectively. Meeting date dummies are constructed for the largest meeting dates, where dates between large meeting dates are assigned to the closest large meeting date.

Table 1.6: Comparing Results with Past Research

Panel A: Overall Effect of Grant

	This Study	APS
	(1)	(2)
All Charities	0.170***	0.222***
Small Charities	0.339***	0.404***
Medium Charities	0.168***	0.184***
Large Charities	0.000	0.043

Panel B: Effect of Dollar Value of Grant

	This Study		APS	
	Small Charities	Medium Charities	Small Charities	Medium Charities
	(1)	(2)	(3)	(4)
Awarded Funding t=0	0.333***	0.322***	0.223***	0.242***
Awarded Funding t=1	0.330***	0.428***	0.254***	0.338***
Awarded Funding t=2	0.199***	0.368***	0.302***	0.347***
Awarded Funding t=3	0.098***	0.249***	0.075	0.198
Awarded Funding t=4	0.052**	0.175***	0.05	0.518***
Sum of 3 years	0.862	1.118	0.879	0.927
p-value, test = 1	(0.021)	(0.427)	(0.165)	(0.692)
Sum of 5 years	1.012	1.542	1.005	1.643
p-value, test = 1	(0.892)	(0.017)	(0.973)	(0.079)

Notes: * p¡0.1, ** p¡0.05, *** p¡0.01. APS referes to Andreoni, Payne and Smith (2014). Coefficients in Panel A represent the percent increase in revenue from being awarded a grant. This paper's definition of small charities is less than $100,000 in average total revenue, medium charities between $100,000 and $500,000 and large charities over $500,000. APS definition of small charities is between 10,000 and 100,000 in revenue, medium is between 100,000 and 1 million and large charities are between 1 million and 5 million. Panel A dependant variable is log total revenue. Panel B dependant variable is total revenue in dollars (this study) and in pounds (APS).

Figure 1.1: Amount Requested and Awarded by Program

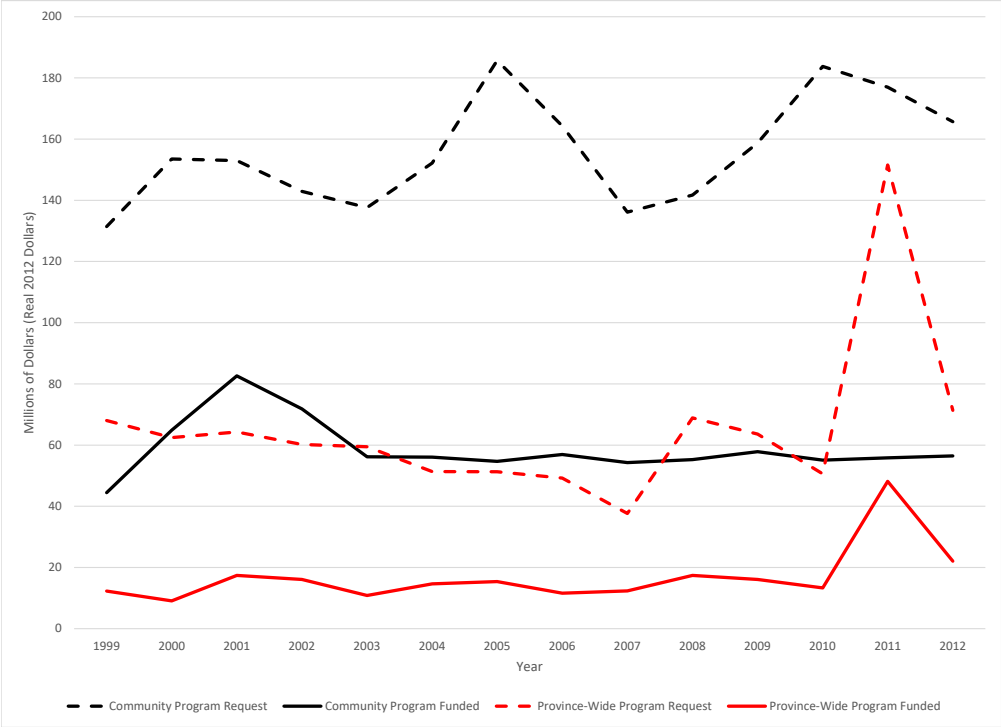


Figure 1.2: Applications by Type of Organization

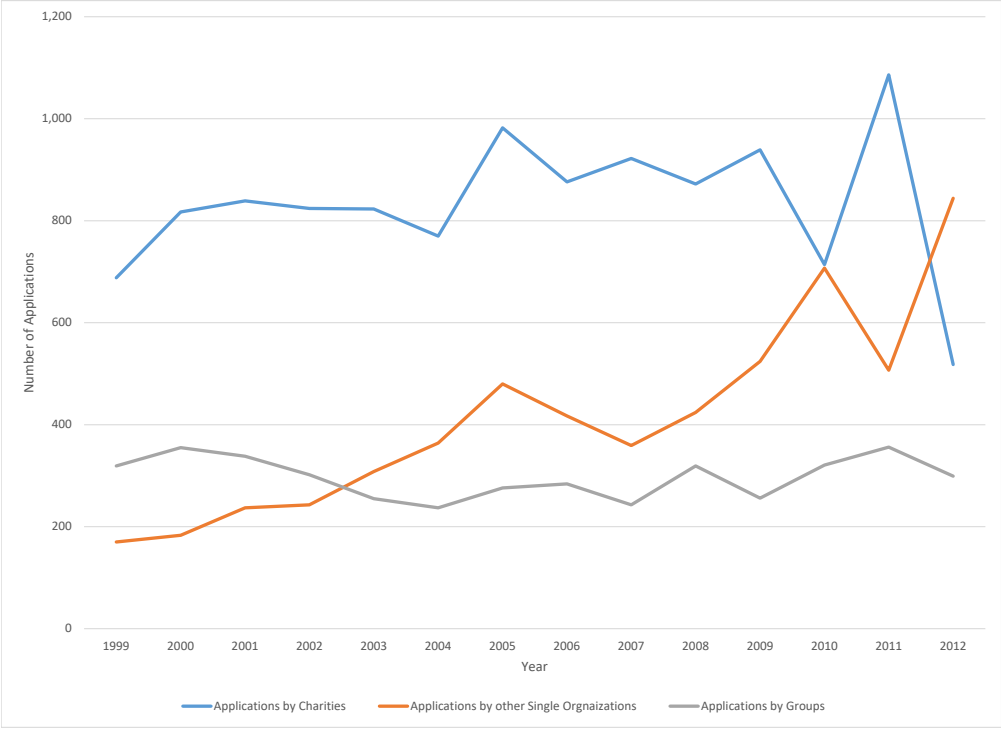


Figure 1.3: Share of Applications by Charities in Region, 1999-2012

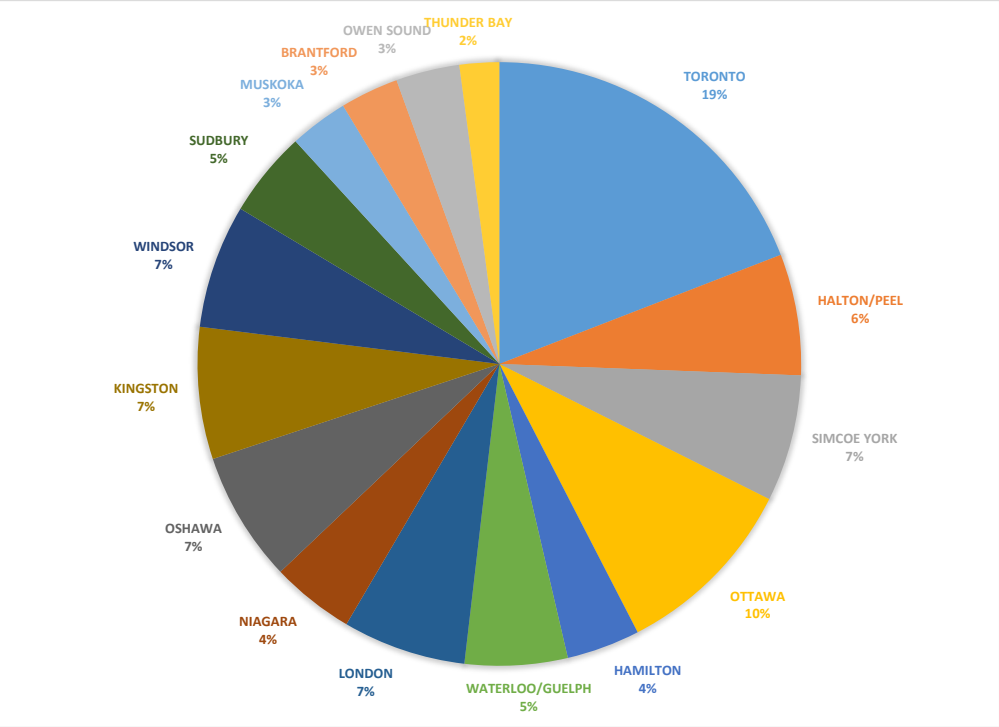


Figure 1.4: Share of Awards by Charities in Region, 1999-2012

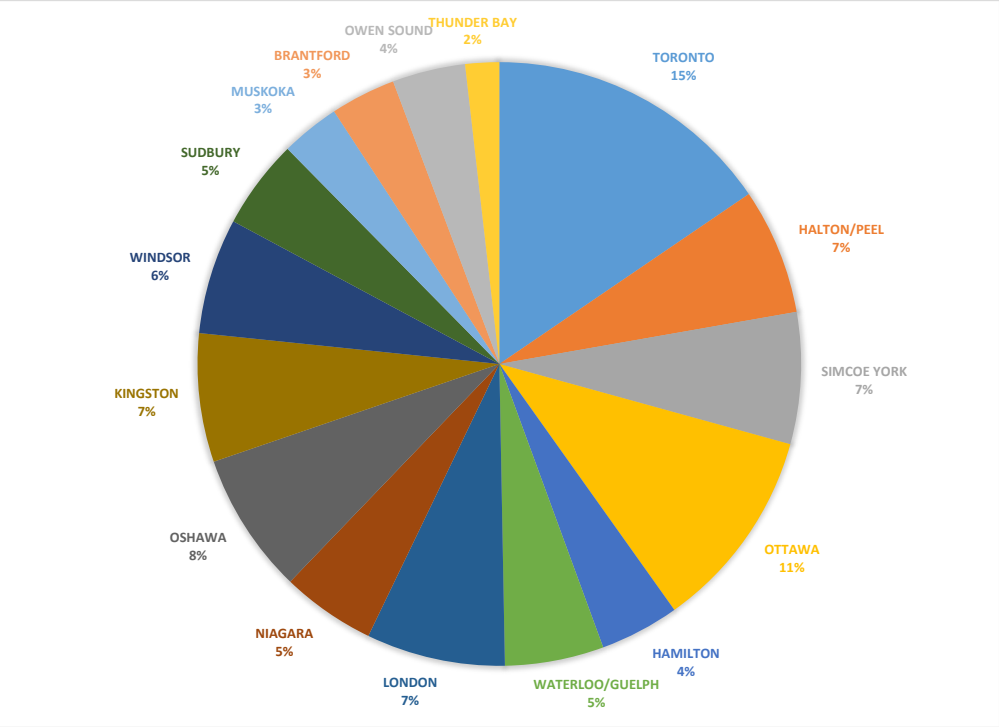
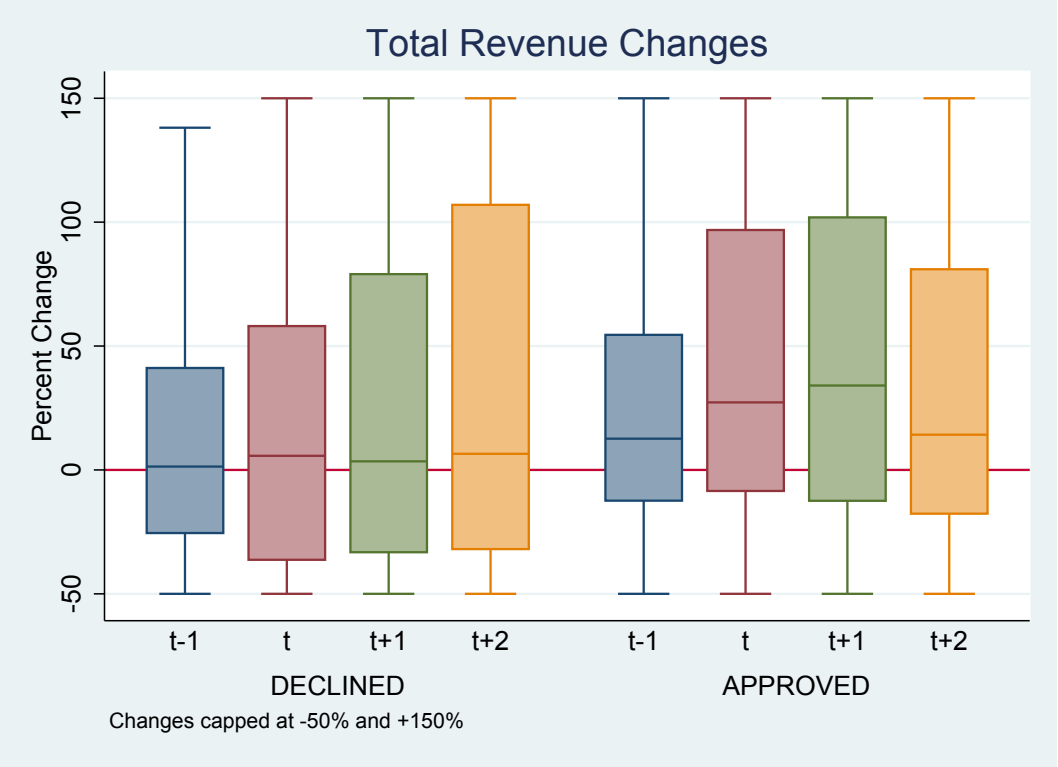


Figure 1.5: Total Revenue Changes



Chapter 2

How Effective are Charity Managers? Evidence from a Panel of Charities

2.1 Introduction

Charities play an important role in society by providing many goods and services that contribute to the building of our communities, and by servicing the needs of those facing financial, personal and other hardships. Donors, be they private individuals or government agencies, must choose to which charities they donate and their donation decision may be influenced by the perceived impact that their gifts and grants has on servicing those in need.[1] There is, however, limited quantitative work on charity performance. Past empirical work has focused on measuring objective functions of charities. Steinberg (1986) shows empirically that there is great heterogeneity in

[1]For a summary of previous work on the many motivations for giving see Andreoni (2006) and Andreoni and Payne (2013)

the measured objective functions of charities and one possible explanation for this heterogeneity is differences in the charity managers (Rose-Ackerman (1987)).

In any organization, leadership matters. Whether the setting involves CEOs setting firm policies that influence profits and acquisitions, or principals setting school policies that influence student behaviour and teacher hiring practices, empirical evidence of the effect of leadership is prevalent.[2] Leadership may also matter for non-profit firms, yet the empirical evidence on the impact of leaders in the non-profit sector is lacking. This paper fills this gap by employing a multi-leveled fixed effects model (often used in studies of leadership in other settings) to estimate the effect of charity managers.

Charities present a unique case in which to study leadership because unlike competitive firms who maximize profits, charities do not have a clear objective function. Weisbrod (1991) points out that "A great deal of literature in public administration highlights the 'vagueness and intangibility' of public-sector outputs; it underscores 'the unique difficulties in specifying and quantifying performance measures in the public sector'." Previous studies (such as Tinkelman (2004) and Sieg and Zhang (2012)) have attempted to quantify the effect of charity managers but have faced the problem of using datasets that contain information about charity performance but no information about the managers, which limits their ability to conclusively measure the effect of the manager. This paper overcomes this problem by using a dataset that contains both the identities of charity managers and the charity's financial information. This allows us to track charity managers across different charities and allows us to present the first causal evidence of the effect of charity managers.

From both a theoretical and empirical perspective we must take into account

[2]See Bertrand and Schoar (2003) and Malmendier and Tate (2009) for evidence on CEOs, and Dhuey and Smith (2014), Branch, Hanushek, and Rivkin (2012), and Coelli and Green (2012) for evidence on school principals.

that the motivations of charity managers may not be equivalent to those in other sectors. From an empirical perspective, disentangling the effect of a charity leader from other confounding factors is challenging. This paper starts by presenting a simple theoretical model of how charity managers make financial decisions for the charity based on their abilities that establishes a relationship between a manager's ability and the financial outcomes of the charity. Here, ability is measured by differences in costs for both raising funds and providing the charitable good. The model shows that when managers care about the quality-adjusted quantity of the charitable good, the leader's quality can be inferred from their influence on financial measures, such as total revenue, for the charity.

This theory motivates the empirical analysis which uses a multi-leveled fixed effects model commonly used in other studies of leadership, to measure the quality of the manager. This method requires movement of charity managers between charities in order to disentangle the effect of the leader from the effect of the specific charity. In order to interpret these results as causal it must be that changes in charity managers are unrelated to changes in the financial outcomes used to measure the quality of the managers. The analysis uses a dataset that contains financial information for a panel of 460 religious-based social service charities over a span of 23 years, allowing us to observe more than 1100 different managers that move between different charities over time.

We find that a one standard deviation increase in manager quality leads to a 0.516 standard deviation increase in total revenue, which amounts to over $500,000, with similar magnitudes for other sources of revenue and expenditures on programs. Replacing an average manager with a good manager raises total revenue by 0.139 standard deviations, which translates to nearly $200,000 increase in yearly revenue. We then determine what manager characteristics are associated with higher quality

managers. We find evidence that both married couples and individuals are effective managers depending on the measure used as the outcome, and find that female managers are of higher quality than male managers for most measures.

We further explore the extent to which these results are due to match effects between managers and charities. Our results suggest that these match effects are positive for most measures of revenue and expenditures, suggesting that better leaders are placed at better charities. Finally, we estimate a model that allows for the effect of the manager to persist beyond their tenure at a given charity. These estimation results suggest that the baseline specification tends to overestimate the effect of the managers for most financial outcomes and highlights the need to take into account the longer-term effect of managers on charity outcomes.

The paper proceeds as follows: section 2.2 reviews previous literature on the study of leadership; section 2.3 presents the theoretical model; section 2.4 describes the data used for the empirical analysis; section 2.5 presents the empirical framework and details the identification strategy; section 2.6 presents the baseline results; section 2.7 discusses extensions to the baseline model and section 2.8 concludes.

2.2 Literature Review

In this section we highlight the main contributions to the study of how charities operate and how the managers of charities influence charity operations. Rose-Ackerman (1987) develops a theoretical model to show how the managers of charities respond to government grants and provides a theoretical explanation for the partial crowd out of donations found in past empirical studies. The manager has an ideal good that they would like to provide. To fund provision through private donations the manager chooses a good that is closer to the type of good that donors would pre-

fer rather than the manager's ideal type of good. In response to government grants the manager does not need as many private donations and therefore chooses a good closer to their own ideal type of good, leading to fewer private donations. This paper is significant in the charities literature for a number of reasons. First, it acknowledges that part of the reason that government grants may partially crowd out private donations is that charity's react by decreasing their fundraising expenditure (a hypothesis confirmed empirically by Andreoni and Payne (2003).) Secondly, the author provides a model to show that managers of charities are heterogeneous and that this heterogeneity affects the finances of the charity that they manage.

Besley and Ghatak (2005) expands this theoretical literature by studying the importance of incentives and organizational mission in the behaviour of agents. Their model suggests that one of the reasons that it may be beneficial to have private nonprofits provide public goods as opposed to direct government provision is that these nonprofits can generate variety in their missions, which will attract managers with a similar mission. The match between a manager and a nonprofit will lead to improved productivity that would not be realized under government provision. This suggests that part of the heterogeneity seen in charities' objective functions may be a result of differences in charity managers who select in to managing charities and nonprofits.

Steinberg (1986) uses data on fundraising expenditures and private donations from nonprofits in the US over a three year period to estimate charity objective functions. Using the "marginal donative product" which is the return on the last dollar of fundraising expenditure, the author finds that the objective function of charities varies between different types of charities; welfare, education, and arts firms are net revenue maximizers, health firms are total revenue maximizers and research firms' objective functions are undefined. This paper was the first to estimate the objective functions of nonprofit firms, and provided the first evidence that there exists

heterogeneity amongst nonprofit firms.

The two empirical papers most closely related to this study are Tinkelman (2004) and Sieg and Zhang (2012). Tinkelman (2004) uses data from charities in the US to estimate charities' fundraising elasticities (the change in donations received as fundraising expenditures change). He then argues that these fundraising elasticities can show whether charities are net revenue maximizers (elasticities close to 0) or total revenue maximizers (elasticities close to 1), which in turn reveals the charity manager's objective function. He finds that fundraising elasticities for charities differ by charity type but that they typically fall somewhere between 0 and 1, with many falling between 0.07 and 0.27.

Sieg and Zhang (2012) estimate the effect of charity managers by using a production function determining donations with fundraising expenditures, government grants, and managerial capacity as its inputs. Using data from land conservation charities in the US they find that managerial capacity, as measured by wages and salaries of managers and employees and expenses on equipment, office space, and other operational expenses, is an important factor in determining donations. Their finding is shown to be robust to different estimators of the production function, such as the Olley and Pakes estimator, dynamic panel data estimators and fixed effects estimators.

Both Tinkelman (2004) and Sieg and Zhang (2012) offer a unique way of measuring the effect of leadership in the context of charities; however, they share one key feature. The data used in each paper does not contain information about the managers of the charity; as such, they cannot identify changes in leadership. So while each paper contributes to the understanding of the importance of leadership in charities, they only provide indirect evidence of the effects of charity managers. This paper aims to fill this gap by providing direct evidence of the effect of charity managers.

2.3 Theoretical Model

To motivate the empirical analysis we now present a theoretical model. Each manager, i, of charity, j, has preferences, $U(q)$ where q which is the quality adjusted quantity of the goods and services provided by the charity, where $U'(q) > 0$ and $U''(q) < 0$.[3] To finance the provision of the charitable good, q, each manager must solicit revenue from different possible funding sources, $s = 1, ..., S$, available to the charity. Examples of different sources include private donations, government revenue and revenue from other charities. The amount of revenue that can be raised from each source depends only on q and is denoted by $R_s(q)$ where $R'_s(q) > 0$ and $R''_s(q) < 0$.

Managers differ in their ability to raise funds from a given revenue source and their cost of providing the quality adjusted quantity of the charitable good. Let $z^i_{s_j}$ be the proportion of funds from source s that represents the cost of raising each dollar from that source. These costs can be thought of as administrative costs associated with raising the funds, such as administrative time spent filling in grant applications, fundraising expenditures or time spent soliciting individual donations, but importantly are not costs associated with providing the charitable good. This means that $(1 - z^i_{s_j})$ of the revenue raised is able to be used to fund the provision of the good. Managers are also heterogeneous in the cost of providing the good, denoted by $c_{i,j}$ per unit, so that the total cost of providing q is $c_{i,j}q$. This means that each manager at charity j has a vector of characteristics $(c_{i,j}, z^i_{1_j}, ..., z^i_{S_j})$.

We can use the heterogeneity in the costs between managers to measure the quality (or ability) of the manager. A manager with a lower value of $c_{i,j}$ is able to provide the good at a lower cost, and is considered a higher quality manager. Similarly, a manager with a lower value of $z^i_{s_j}$ is able to raise funds at a lower cost, and again

[3]For simplicity all managers are assumed to have the same preferences.

is considered a higher quality manager.[4] Assume that for any two managers, i' and i'' that if $c_{i',j} \geq c_{i'',j}$ for some j, then $c_{i',j} \geq c_{i'',j}$ for all j, with the same property holding for each $z^i_{s_j}$ as well. That is, the ranking of managers according to quality is independent of the charity. One way that this could hold is if the manager's quality is simply scaled by the charity that they run.

The budget constraint for a manager at a given charity j can be written as:

$$\sum_{s=1}^{S}(1 - z^i_{s_j})R_s(q) \geq c_{i,j}q \tag{2.1}$$

Since $U'(q) > 0$ each manager will choose q^* to ensure that (2.1) binds; this uniquely determines $q^*(c_{i,j}, z^i_{1_j}, ..., z^i_{S_j})$.[5] Given (2.1) binds at the optimum, the budget constraint can be re-written as:

$$\sum_{s=1}^{S} R_s(q^*) = c_{i,j}q^* + \sum_{s=1}^{S} z^i_{s_j} R_s(q^*) \tag{2.2}$$

The left hand side of (2.2) is the gross revenue raised; the right hand side is the sum of the amount spent on programs, $c_{i,j}q$, and the costs associated with raising the

[4]For simplicity, we assume that all $c_{i,j}$ and $z^i_{S_j}$ are uncorrelated. If we think that managers are either good all-around or bad all-around, then this assumption would be incorrect, as a high $z^i_{S_j}$ for one value of S would be associated with a higher $z^i_{S_j}$ for each S. Instead, this assumption implies that managers are more likely to specialize in their abilities. One manager may have skills that are conducive to acquiring government grants at a lower cost but not have skills associated with raise funds from other sources at a similar low cost.

[5]A value of $q = 0$ will also bind the constraint, but instead we will focus on the unique positive value for q.

funds, $\sum_{s=1}^{S} z_{s_j}^i R_s(q)$. Totally differentiating (2.2) yields:[6]

$$\frac{dq^*}{dc_{i,j}} = \frac{q^*}{[\sum_{s=1}^{S} R_s'(q^*)(1 - z_{s_j}^i) - c_{i,j}]} < 0 \tag{2.3}$$

$$\frac{dq^*}{dz_{s_j}^i} = \frac{R_s(q^*)}{[\sum_{s=1}^{S} R_s'(q^*)(1 - z_{s_j}^i) - c_{i,j}]} \leq 0 \quad \forall s = 1, ..., S \tag{2.4}$$

To estimate the quality of a manager we would ideally observe $c_{i,j}$ and $z_{s_j}^i$ for each manager or a measure of q^* since q^* depends on both $c_{i,j}$ and $z_{s_j}^i$; however these are all unobservable. What we are able to observe in the data used in the empirical analysis are values for $R_s(q^*)$ and $c_{i,j}q^*$.

In order to use values of $R_s(q^*)$ and $c_{i,j}q^*$ to measure manager quality we need to determine how the values change in response to differences in manager ability. First, we want to determine how the amount spent on providing the good, $c_{i,j}q^*$, changes in response to changes in the ability of the manager as measured by changes in $c_{i,j}$; that is $\frac{dc_{i,j}q^*}{dc_{i,j}}$. Totally differentiating $c_{i,j}q^*$ and substituting in (2.3) we find that $\frac{dc_{i,j}q^*}{dc_{i,j}} < 0$. Managers with a lower cost of providing the good (lower $c_{i,j}$) will have a higher amount spent on providing the good, $c_{i,j}q^*$.

Secondly, the ability to raise funds, as measured by $z_{s_j}^i$, affects the revenue from each source $R_s(q^*)$. Recalling that $R_s'(q) > 0$, we simply need to find the effect of $z_{s_j}^i$ on q^*. From (2.4) we have that $\frac{dq^*}{dz_{s_j}^i} \leq 0$, with equality holding only when $R_s(q^*) = 0$. If a higher quality manager has a lower level of $z_{s_j}^i$ then this will lead to a higher value for q^*, which in turn leads to a higher level of $R_s(q^*)$.

Notice however that $z_{s_j}^i$ affects $c_{i,j}q^*$ and that $c_{i,j}$ affects $R_s(q^*)$, both through q^*. This could potentially impact how the values of $c_{i,j}q^*$ and $R_s(q^*)$ can be used to infer the quality of a manager. First, from (2.4) we can see that $\frac{dc_{i,j}q^*}{dz_{s_j}^i} \leq 0$. From above we saw that a higher quality manager in terms of ability to produce the good at a lower

[6]See Appendix 2.9 for more details.

cost leads to a lower value of $c_{i,j}q^*$. Here we can see that a higher quality manager in terms of ability to raise revenue at a lower cost will also have a lower value of $c_{i,j}q^*$, so the interpretation still holds. Similarly, $\frac{dR_s(q^*)}{dc_{i,j}} < 0$, so a manager with a high ability in terms of providing the good at a lower cost will have a higher value of $R_s(q^*)$.

To summarize, both the revenue obtained from each different source and the total amount spent on providing the good are increasing in manager quality, as measured by the manager's ability to raise revenues at a lower cost and ability to provide the good at a lower cost. This leads to the choice of outcome measures for the empirical analysis; total revenue, three different sources of revenue (private donations, government revenue and revenue from other charities), and the total amount spent on providing the charitable good. Estimating how the managers influence these outcomes will allow us to measure the quality of the managers.

2.4 Data

2.4.1 Sample

For reasons discussed in more detail in section 2.5, the empirical strategy requires managers to be observed at more than one charity. In order to address this need, we select a sample of charities in Canada that all belong to a single national organization. This allows us to follow managers across different charities with a great deal of certainty that they are the same manager which is of vital importance for proper identification of the manager's quality.

The organization used for the analysis is a national religious-based social service organization. The organization has a national head office, as well as 7 regional head offices and over 600 charities across Canada. These centers provide a relatively ho-

mogeneous set of social services including church activities, food banks, counseling, homeless shelters and/or other social services. There is a national director of the organization and regional directors at each regional head office. As this organization is also a church the majority of directors in the sample are clergy and most of them are married (both spouses are clergy). The clergy are employed by the national head office, which enables the head office to move them between charities. This last feature of the organization's structure is the key that allows us to use this data for the purposes of this analysis. We will only use the local charities in our dataset, as regional and head office perform mostly administrative tasks to support the local centers.

One of the main obstacles to studying charity leadership in the past has been the ability to find data that contains information about both the charity's manager and the charity's finances. Using data from three different sources, we are able to construct a dataset that not only matches charity managers and charities, but also contains detailed information about the neighbourhoods in which the charities are operating.

The first source of data comes from charity information returns (T3010) filed by Canadian charities with the Canada Revenue Agency (CRA) each year. In order to maintain charitable status each charity must file an information return every fiscal year.[7] The T3010 contains detailed breakdowns of revenues, expenditures, assets and liabilities, as well as location information for the charity.[8] Importantly, the information return also requires charities to provide the names of the directors and managers of the charity. From these names we are also able to identify the gender of the manager.[9] We are also able to identify if the manager is an individual or if a married

[7]The key benefit to charitable status is the ability to issue tax receipts for donations.

[8]While the true location for each charity is confidential and not provided in the data, a mailing address is provided. For the sample used in the analysis the mailing address has been verified using publicly available address information and corrected to the physical location when necessary.

[9]While names do not always identify gender, for the names in the dataset we are able to identify

couple co-manages the charity.

The second data source is the Canadian census which is collected every five years. We use measures from the 1991, 1996, 2001, 2006 and 2011 censuses and linearly interpolate these measures for the years between the census years. The census measures are constructed at the neighbourhood level which is defined by the first three characters of the postal code, known as the forward sortation area (FSA). Each FSA has around 8,000 households on average. The measures used from the census are designed to help control for the socio-economic characteristics of the neighbourhood in which the charity operates.

The final source of data is an internal publication from the organization and contains detailed information about the locations of each charity, as well as the manager assigned to that location for the year. This data is mainly used for verification purposes to ensure that the physical location of the charity is accurate, and that the assignment of managers to charities is correct.

The financial data from the T3010 spans the years 1992-2014 but the form only includes a section for the information on managers from 1997 onwards. Using supplemental data obtained from the organization, we are able to match managers to charities for the period from 1992-1997, meaning that the final dataset of managers and financial information spans 1992-2014. The original sample contains 608 different charities. Of these, 70 are removed because they are not social service providers (such as administrative arms), 52 are removed because they do not have at least 3 years of data in which the manager can be identified and 26 are removed because they never have a manager that has been at another charity. This leaves a final sample of 460 charities with a total of 8,909 observations and 1,103 managers.

It is worth noting here what is meant when we refer to one manager in the analysis.

the gender with a significant level of accuracy.

As mentioned previously, some of the managers are married couples. Since most of these married couples are only ever observed together at the same charity, it is not possible to separate their individual effects. For this reason, we treat married couples as one manager, so each manager will either be an individual or the couple as a whole. It is also important to note that those that we may identify as an individual manager may in fact be married, but their spouse is simply not also a manager. If the couple is at any point assigned to separate charities they are each treated as new managers for our purposes.

2.4.2 Summary Statistics

Table 2.1 shows the summary statistics for charities. Panel A describes the financial measures used for analysis, where all figures are in 2014 dollars. The mean charity has $762,000 in total revenue over the sample period, with a minimum of $34,800 and a maximum of over $10 million. Total revenue has a variance of over $1.3 million, with similar magnitudes for the variance of program expenditures ($1 million) and government revenue ($958,000) suggesting that there is great heterogeneity across charities for these measures. The average charity has program expenditures of $555,000 meaning that the average charity spends approximately 73% of their total revenue on providing the charitable good. Donations from other charities were not recorded on the form prior to 1997, so only the 445 charities with records after 1997 are included in the sample for analysis. The minimum is zero or very close to zero for private donations, government revenue and donations from other charities which indicates that there is at least one charity that records very little revenue from those sources in all years. It is important to note that while private donations, government revenue and donations from other charities are the primary components of total

revenue, they are not exclusively what constitutes total revenue. Other elements of total revenue could include revenue from sales, revenue from fees, and revenue from investments among others. None of these components of total revenue, however, are large enough to merit inclusion in this analysis.

Panel B of Table 2.1 reports summary statistics for the neighbourhoods in which the charities operate that are used as control measures in the analysis. This shows that the neighbourhoods in which the charities operate are diverse in measures of population size, income, education, and other characteristics. We include information about the unemployment rate, the percent of the population who are immigrants, and the percent who are low income to try to control for the size of population that is potentially served by the charities.

Turning to statistics about the managers and changes in leadership we can see from Panel A of Table 2.2 that the average manager appears for almost 8 years in the dataset, is observed at 2.2 different charities, and stays at a charity for 4 years. At the extremes, the longest tenured manager at a single charity is at that charity for 21 of the 23 years in the sample, and the manager who has managed the most charities has run 8 different charities. Panel B presents the statistics for the managers from the charity's perspective. The average charity has over 5 different managers over the sample and changes managers every 3.8 years.

These summary statistics show that there is great variation across charities in the financial measures, as well as many changes in leadership for the charities over the sample. The next section outlines the empirical strategy and details how changes in charity managers can be used to identify the effect of the managers on these financial measures.

2.5 Empirical Framework

To test whether charity managers have an effect on the financial outcomes of the charity we estimate a multi-leveled fixed effects model commonly used in studies of leadership:

$$Y_{jt} = \alpha_t + \gamma_j + X_{ct}\delta + \lambda_{Manager} + \epsilon_{jt} \tag{2.5}$$

Y_{jt} is the financial measure of interest for charity j in period t, α_t are year fixed effects, γ_c are charity fixed effects, X's are characteristics of the neighbourhood in which the charities operate and λ are manager fixed effects. This model is estimated using multi-leveled fixed effects as described in Mihaly et al. (2010), with $\lambda_{Manager}$ as the parameters of interest. In order to separately estimate $\lambda_{Manager}$ and γ_j we require there be managers who move between different charities. Specifically, (2.5) is estimated over a connected group of charities and managers.[10]

Within these groups, the charity and manager fixed effects are over-parameterized. In most cases the way this is addressed is by leaving out an arbitrary manager fixed effect. This does not work in our context since the manager fixed effects are the parameter of interest and all other fixed effects are interpreted as deviations from whichever fixed effect is left out. Leaving out an arbitrary fixed effect will produce greatly different results depending on which fixed effect is left out. Following McCaffrey et al. (2012) we restrict the mean of the manager fixed effects to be zero within each group so the fixed effect estimates are interpreted as deviations from the mean manager of each group.

Between 94% and 97% of the managers are connected in a single group, depending

[10] A clever analogy from Mansfield (2015) adapted to this paper's context explains the connected groups in the following way: imagine the group as a connected graph where charities are vertices and managers are edges. Any two charities in the group are connected by a manager that has been at both charities; any two managers in the group are connected by a charity where they have both been managers.

on the financial measure used for analysis. Since the one group is so large, we restrict our analysis to this one group. All estimates are reflected as deviations from the mean manager of this single group.[11]

2.5.1 Endogenous Manager Changes

A possible threat to the identification of the manager fixed effects is the presence of endogenous changes in managers. The concern about endogenous mobility comes from the way in which the manager fixed effects are identified. If a manager is observed at more than one charity then their quality can be compared to the quality of the other managers at those charities. Since it is the connectedness of the managers and charities that allows for the identification of the manager fixed effects, if at one charity there is only one manager that has been at another charity then it is required that their ability to influence outcomes is the same at each charity. This allows us to properly identify the relative quality of each charity where the manager has been, which then allows for the proper identification of the manager fixed effect. The main cause for concern with endogenous manager movement is for a manager to move to or from a charity that is about to either boom or bust. This would alter the manager's ability to influence the financial outcomes and thus would bias our estimates of the manager fixed effects. We test for the possibility of this in section 2.5.2.

It is important to note that certain types of movements of managers that may seem endogenous do not bias the estimates of the effect of the managers in this setting. An example of this is if managers systematically move from worse charities to better charities or vice versa. This is because the true quality of the charity is already accounted for in the charity fixed effect. Therefore, the manager fixed effect

[11]Other than the one large group, there are between 12 and 18 other groups (depending on the outcome measure), which have at most 34 observations in each group with most groups having between 10 and 20 managers. The results are robust to including these small groups in the analysis.

will still be measuring the true quality even if the managers are moving from worse to better charities. Managers who are of higher or lower quality moving more often is also not cause for concern for similar reasons. Note, however, that this only is the case for time-invariant characteristics of the charity that are captured by the charity fixed effect. For example if a particular charity is able to grow revenues quicker, this will not be picked up by the charity fixed effect and may bias our results. This is what we test for in section 2.5.2.

To better understand how the changes in managers may be of concern it is helpful to know more about the institutional details of the organization. Each regional director of the organization is responsible for determining if a charity in their region is to undergo a change in leadership. The regional director makes this decision with input from the current manager of the charity, and if the charity is a church, input from the church's membership. While some changes happen throughout the fiscal year, the vast majority of changes occur the last week of June or the first week of July, depending on the year.[12]

Once the regional director decides that a particular charity will change leadership, the list of managers that are to be moved from those charities is sent to the national head office. There, the human resources department and the senior leadership team at the national head office decide where the managers will move. This matching of vacancies with available managers also involves flows in and out of the pool of potential managers. Normal transitions in and out of the pool of potential managers include retirements, new hires, managers who take positions at charities outside of

[12]The fiscal period ends in March for each charity, so the leadership change happens 3 months into the fiscal year. The financial data contains only a year by year breakdown so it would not be possible to identify which part of the revenues or expenditures can be attributed to which manager. Since the new manager is at the charity for 9 months of the fiscal period, and especially during the busiest time for charities around the end of the calendar year, we make the decision to treat the charity as being under the leadership of the new manager for the entire fiscal period.

Canada with a related organization, and managers who take administrative positions within the national or regional head offices.

It is likely the case that the movement of managers between charities is not truly random. From informal conversations with those involved in the process of assigning available managers to available positions, there is evidence that the organization makes an attempt to assign managers to charities that they feel would be a good match. Whether a good match for the organization can be measured as a good match in terms of financial outcomes is not inherently clear. This attempt to match managers to charities further motivates the analysis in section 2.7.1 which tests for the presence of match effects; this is however a separate issue from endogenous movement of managers.

Knowing what we know about the process of deciding which managers are to be moved it is not clear if we should be concerned about endogenous changes of managers biasing the estimate of the manager fixed effects. Nevertheless, we will still test for endogenous changes in the next section.

2.5.2 Testing for Endogenous Manager Changes

If changes in managers are not exogenous the estimates of the effect of the managers may be biased. As discussed above, one potential threat to properly estimating the effect of managers is that managers move just before or after a charity is about to boom or bust. If we can predict the changes in managers using the leads and lags of changes in the financial outcomes used for analysis then this may suggest that the changes in managers are related to booms and busts for the charities which may bias our results. Table 2.3 shows the estimates for whether a charity in year $t+1$ has a different manager than in year t estimated using OLS. As covariates we use changes

in all of the outcome measures, except for donations from other charities, and their leads and lags, as well as all of the control variables.[13] The change in the outcome measures is calculated as the absolute value of the percent change from year $t-1$ to year t, the first lag is the absolute value of the percent change from year $t-2$ to year $t-1$ and the first lead is calculated as the absolute value of the percent change from year t to year $t+1$.

The first column of Table 2.3 shows the results using only the current changes and no leads or lags. The coefficients are measured in percentage point changes. We can see that a one percent change in total revenue is associated with a 0.06 percentage point decrease in the probability of changing managers. While this is statistically significant, the effect is very small economically. The coefficients on the changes in private donations and government revenue are both positive but insignificant, while a one percent change in program expenditure is associated with a 0.03 percentage point increase in the probability of changing managers, which while being statistically significant is again very small. The R-squared from this regression is very low at 0.008.

In column 2 both a one period lead and a one period lag are added for each of the measures to try to account for possible patterns in the years before or after a change in leadership takes place. The coefficients on the current year changes are all very similar to the first column and all have the same significance levels as before. As for the leads and lags, the coefficient on the first lag of private donations is small, positive and significant at the 1% level, while the coefficients on the first lag of both government revenue and program expenditure are negative and statistically significant. Finally, the only coefficient on a lead that is significant is on program expenditure which is negative. While there are several coefficients that are statistically significant, none are

[13]Donations from other charities is excluded since the measure is only available from 1997. Results are robust to including donations from other charities.

large in magnitude, with the largest being the coefficient on the first lag of government revenue at -0.13 percentage points. Even after including both the first lead and first lag for each outcome measure, the R-squared is still only 0.0093.

These results suggest that while there are some changes in the outcome measures that are associated with a change in managers, less than 1% of the variation in these changes in managers can be accounted for by changes in the outcome measures in the years surrounding the movement of managers. This provides evidence that the changes in managers are exogenous and that the estimates of the effect of the manager are not biased from the possibility of endogenous movements of managers across charities.

2.6 Baseline Results

The baseline results are presented in Table 2.4. The coefficients of interest pertain to the manager fixed effects. Given the number of observations it would be impractical to report the estimates for every fixed effect, so instead, only the standard deviation, adjusted standard deviation, different percentiles of the distribution, and the difference between the 75^{th} percentile and the median are reported. Also reported is the p value from the F-test of the joint significance of all of the manager fixed effects. Recall the fixed effects are re-centered so that the mean is 0.

To account for sampling error in the estimates of the manager fixed effects we adjust the standard deviation following the method in Aaronson, Barrow, and Sander (2007) to better reflect the true variance in the manager effects. Assume that the estimated manager fixed effect, $\hat{\lambda}_M$, is composed of the true manager fixed effect λ_M and normally distributed independent disturbance with mean zero, ϵ, such that $\hat{\lambda}_M = \lambda_M + \epsilon$. Since the two components are independent it follows that $\hat{\lambda}_M^2 = \lambda_M^2 + \epsilon^2$. To obtain the true manager effect, we need to subtract the sampling error term from the mea-

sured manager effect. Since ϵ^2 is not observable, we estimate it by finding the mean of the square of the standard errors of $\hat{\lambda}_M$, which is the estimated variance.

The analysis will focus on the adjusted standard deviation, which represents the effect of a one standard deviation increase in manager quality, and the difference between the 75^{th} percentile and the median which represents the effect of replacing an average quality manager with a good manager.

Table 2.4 reports the estimated manager fixed effects for the four measures of revenues and program expenditures. All financial measures have been normalized to mean zero and variance one, so these fixed effect estimates are interpreted in standard deviations. From the theoretical model recall that manager quality is measured as the ability to increase revenue or increase the amount spent on providing the good (program expenditures).

Focusing on the adjusted standard deviation, we can see that for total revenue, a one standard deviation increase in manager quality leads to a 0.516 standard deviation increase in total revenue, while replacing an average leader with a good leader (the difference between 75^{th} percentiles and the median) increases total revenue by 0.139 standard deviations. For private donations, moving up one standard deviation in the manager quality distribution leads to an increase of 0.442 standard deviation increase in private revenue, while the difference between a good leader and an average leader is 0.172 standard deviations. The effect of a one standard deviation increase in manager quality is of similar magnitude for government revenue (0.397), donations from other charities (0.687) and program expenditures (0.635). Similarly, the effect of replacing an average manager with a good manager is 0.084 for government revenue, 0.170 for donations from other charities and 0.155 for program expenditures. The p-value for the F tests of the joint significance of all manager fixed effects strongly rejects the hypothesis of no manager fixed effects.

These results show that a manager can have a significant impact on all of these different measures of revenue and expenditure, but how large are these estimates in terms of dollars? Moving from an average quality manager to a good manager results in an increase of nearly $200,000 in total revenue which represents more than 25% of the mean total revenue for charities. For private donations moving from an average quality manager to a good manager leads to an increase in private donations of nearly $27,000. The next section explores the characteristics of managers that are associated with higher quality managers.

2.6.1 Patterns in Leadership

There are two characteristics of the manager that we can use in order to help understand what attributes are associated with a good manager. The first is whether the manager is a married couple or an individual. Secondly, for the individual managers the gender is identified from their first name. Using these two characteristics of the manager we plot the densities of the distribution of fixed effect estimates for each outcome. Figure 2.1 plots the distributions by whether the manager is a married couple or an individual and Figure 2.2 plots the distributions by gender. In addition, the Kolmogorov-Smirnov test for equality of distributions is performed for each outcome measure and the p-values from these tests are reported in Table 2.5.

From Figure 2.1 we first observe that most of the fixed effects are concentrated around the mean of zero. We can also note that from the plots of the distributions it is not obvious that the distribution of fixed effects for married couples and individuals are different. Instead we turn to Panel A of Table 2.5. The null hypothesis for the Kolmogorov-Smirnov test is that each sample is drawn from the same distribution (in other words that the distributions are equal), and the p-values are reported in

the table. Looking first at the test for the equality of distributions we see that the equality of distributions is rejected at any conventional level of significance, with the largest p-value being 0.042. The second test tests whether the distribution for one group contains smaller values than for the other group. In this case, we report both the test for whether managers who are a married couple have smaller values than managers who are individuals and vice versa.

Of the managers in our sample, 782 are married couples and 321 are individuals. For total revenue and for government revenue we reject the hypothesis that married couples have smaller values than individuals and fail to reject the hypothesis that individuals contain smaller values than married couples. This suggests that married couples are better at raising total revenue and government revenue than individuals. For private donations the reverse is true - the test rejects that individuals have smaller values while it fails to reject the test that married couples have smaller values. This means that individuals are better at raising private donations than married couples. Finally, while the test of equality of distributions is rejected for donations from other charities and program expenditures, the test for whether married couples have smaller values and the test for whether individuals have smaller values both are rejected. This means that there are differences in the manager fixed effects for both outcomes, but that neither group contains larger or smaller values than the other.

Panel B of Table 2.5 reports that of the 321 individual managers, 204 are female and 117 are male. Figure 2.2 shows that the distribution of manager fixed effects is more noticeably different for gender than it was for married couples vs. individuals. It is not clear, however which managers have larger values for the manager fixed effects. For each outcome the fixed effects for female managers have a larger number centred at the mean of zero, but from the graphs it is not apparent that there are patterns in the tails of the distribution. In order to analyze this we turn again to

the Kolmogorov-Smirnov test. Panel B of Table 2.5 shows that for each outcome the hypothesis that female managers have smaller effects than males is rejected and that we fail to reject the hypothesis that males have smaller values than females. Interestingly not all tests for equality of distribution are rejected, with the test failing to reject the hypothesis that the distribution of fixed effects for males and females are equal for private donations. These show that females are better manager than males for most outcomes used to measure manager quality.

These figures and tests suggest that there is no clear pattern for whether managers who are married couples are of higher quality versus those who are individuals. However, for individual managers it is clear that the managers who are female are of higher quality than those who are male.

2.7 Extensions

2.7.1 Match Effects

Part of what is being measured in the baseline specification may be match effects between the charity and the manager. These match effects may arise if good managers are placed at good charities (positive match effects) or if good managers are placed at bad charities (negative match effects).[14]

Two methods of testing for match effects are presented below. First, following Dhuey and Smith (2014) we implement the model from (2.5) without charity fixed effects, and then use this to estimate the covariance between charity and manager

[14]Jackson (2013) presents a way to measure the match effects between teachers and schools; however, this method requires a great deal of data. In the teachers and principals literature this data is available since the level of observation is at the student level, and because of this there are many observations per year per school per teacher. The data we use however, contains 1 observation per charity per year, and thus does not have the data required for this method. Consequently, we propose several other ways to estimate the match effects between the manager and the charity.

fixed effects. Second, we estimate a model with charity-manager fixed effects, rather than the additive charity and manager fixed effects from the baseline estimation.

Covariance Estimate

Using a strategy proposed by Dhuey and Smith (2014), we estimate a model without charity fixed effects:

$$Y_{jt} = \hat{\alpha}_t + X_{jt}\hat{\delta} + \hat{\lambda}_{\text{Manager}} + \hat{\epsilon}_{jt} \tag{2.6}$$

and obtain the estimates of $\hat{\lambda}$ which are the manager fixed effects as displayed in Panel B of Table 2.6. For the intuition of why this measures the match effects, consider a specification of the model with only manager fixed effects, $Y_{jt} = \lambda_M + \epsilon_{jt}$. Summing to the manager level this becomes $\bar{Y}_j = \lambda_M$ since the OLS error term ϵ_{jt} sums to zero for each manager. Now, consider a specification with both manager and charity fixed effects, $Y_{jt} = \widetilde{\lambda}_M + \widetilde{\gamma}_j + \epsilon_{jt}$. For the same reasoning as above, this becomes $\bar{Y}_j = \widetilde{\lambda}_M + \widetilde{\gamma}_j$. The variance of each of these are equal, $VAR(\bar{Y}_j) = VAR(\bar{Y}_j)$, so, $VAR(\lambda_M) = VAR(\widetilde{\lambda}_M + \widetilde{\gamma}_j)$ which becomes $VAR(\lambda_M) = VAR(\widetilde{\lambda}_M) + VAR(\widetilde{\gamma}_j) + 2COV(\widetilde{\lambda}_M, \widetilde{\gamma}_j)$. The difference between the baseline adjusted standard deviation and the adjusted standard deviation without charity fixed effects will then indicate if there are match effects and whether these effects are positive or negative.

Panel B from Table 2.6 shows that these differences are relatively large for all measures. For total revenue in particular, the difference between the baseline adjusted standard deviation and the adjusted standard deviation without charity fixed effects is very large (0.370). Private donations, government revenue, donations from other charities and program expenditures all have differences that are of similar magnitude, ranging between 0.149 and 0.233. These results suggest that the match effects are

positive, meaning that high quality managers are placed at high quality charities. The next section uses charity-manager fixed effects as an alternative method for testing for the presence of match effects.

Charity-Manager Fixed Effects

As a second method for estimating the match effects, we estimate the model with charity-manager fixed effects:

$$Y_{jt} = \alpha_t + X_{jt}\delta + \gamma_j * \lambda_{\text{Manager}} + \epsilon_{jt} \tag{2.7}$$

This specification allows for each manager to have a different effect at each charity. If the variance of this charity-manager fixed effect is greater than the variance of the manager fixed effect from the baseline model it would suggest that there are positive match effects; if the variance is less than the baseline model then it suggests that there are negative match effects. If the variance does not change from using charity-manager fixed effects, then this suggests that manager's effect is independent of the charity.

Comparing the results from Panel C of Table 2.6 with the baseline results we see that for all measures the adjusted standard deviation is much larger in the model with charity-manager fixed effects. The difference ranges from 0.119 for donations from other charities, to 0.463 for total revenue, with similar magnitudes for private donations (0.249), government revenue (0.177), and program expenditures (0.351). Similar to what was found with the covariance estimates there are positive match effects for all measures.

Both methods of estimating the match effects between the managers and charities show that these match effects are positive for all outcome measures. These positive

match effects suggest that good managers are placed at good charities.

2.7.2 Persistence of the Effect of Managers

Managers may influence outcomes for the charity beyond their tenure at the charity. For revenues, managers can establish contacts with individuals who commit to give a regular donation, or can apply for multi-year government grants, both of which may last beyond the time when the manager leaves the charity. Likewise, for expenditures the manager can enact programs that continue after they leave the charity. To account for this persistence we estimate the following model:

$$Y_{jt} = \alpha_t + \gamma_j + X_{jt}\delta + \lambda_{\text{Manager},t} + \sum_{t'=1}^{s} \beta_{(t-t')}\lambda_{\text{Manager},(t-t')} + \epsilon_{jt} \tag{2.8}$$

where α, γ, and X are all the same as in the baseline model (2.5), t' is the time when the manager leaves the charity and β is a linear decay.

Table 2.7 reports the baseline results as well as the results from using a linear decay of 3 and 4 years. For total revenue, there is a slight decline in the adjusted standard deviation in both the 3 year and 4 year decay from the baseline results, from 0.516 in the baseline to 0.442 (3 year) and 0.431 (4 year). This suggests that the baseline specification overestimates the effect of the manager by attributing some of what the past manager did to the current manager. The same pattern is seen for program expenditures: the baseline results overestimate the impact of the manager, with the adjusted standard deviation falls from a baseline of 0.635 to 0.581 (3 year) and 0.571 (4 year). For both government revenue and donations from other charities, the baseline estimates are larger than the estimates accounting for persistence, but the 4 year effect is larger than the 3 year effect.

For private donations, we can see a rise in the adjusted standard deviation from

0.442 in the baseline model to 0.617 with a 3 year decay and 0.616 with a 4 year decay. This shows that the baseline model underestimates the effect of the manager because it does not allow the effect of the manager to persist beyond their tenure at a charity.

The results from this specification suggest that accounting for the persistence of the effect of the managers is important for estimating their ability. Since the managers are choosing policies that may affect the charity in the long-term it is not surprising that we see their effect persist beyond their tenure at a charity.

2.8 Conclusion

This paper provides the first causal evidence of the effect that charity managers have over the finances of their charity. We show in a theoretical model that manager quality can be inferred from their ability to raise revenue from different sources and their ability to increase the amount spent on providing the good. Using data that matches managers with financial information from charities, we find that one standard deviation increase in manager quality leads to a 0.516 standard deviation increase in total revenue, with similar effects for private donations (0.442 standard deviation increase), government revenue (0.397 standard deviation increase), donations from other charities (0.687 standard deviation increase) and program expenditures (0.635 standard deviation increase).

Relating these fixed effects to characteristics of the managers shows that there are significant differences in the distribution of the fixed effects for managers who are married couples versus individuals, and also for male versus female managers. Married couples are shown to be higher quality managers when using total revenue and government revenue as the outcome of interest, while individuals are shown to be

higher quality managers for private donations. When comparing the male and female managers, the female managers are shown to be of higher quality for all outcomes. There may be a number of reasons for this finding, including self-selection into this profession.

Extending the baseline model to allow match effects between managers and charities using two different approaches, we find strong positive match effects between charities and managers, particularly for total revenue. These results suggest that the interaction between a manager and a charity is important to take into account when measuring the quality of managers.

A second extension allows for the effect of the manager to persist beyond the tenure of a manager at a charity. In particular, we find that the effect of the managers are smaller for total revenue, government revenue, donations from other charities, and program expenditures than in the baseline model. For private donations the effect of the manager is larger when allowing the effect to persist. These results show that the baseline model can both overestimate and underestimate the effect of the leader when not taking the persistence into account. This persistence is likely to be seen in other settings where leaders set policies, such as principals and CEOs, and should be taken into account in future studies.

These two extensions suggest that while the baseline model has proved useful for studying leadership in other settings, in our setting the match effects and persistence of manager effects need to be taken into account to properly measure the quality of the manager. Future work should examine whether these effects are important for other types of charities (e.g. education or environmental charities)and in other settings (e.g. non-religious organizations).

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Table 2.1: Summary Statistics for Charities

	Obs	Mean	S.D.	Min	Max
Panel A: Outcome Measures					
Total Revenue	460	762.0	1,326.0	34.8	10,830.5
Private Donations	460	161.1	159.1	0.1	1,009.0
Government Revenue	460	324.4	957.5	0.0	6,433.2
Donations from Other Charities	445	84.1	166.4	0.0	2,034.7
Program Expenditures	460	555.4	1,025.5	25.0	6,985.4
Panel B: Control Variables					
Household Income ($000s)	460	63.7	17.3	29.6	206.0
Total Population (000s)	460	26.2	14.2	1.5	103.3
Percent Aged 0-19	460	23.66	4.82	6.54	35.59
Percent Aged 20-64	460	61.73	4.65	52.22	85.36
Percent Aged 65 +	460	14.61	3.98	2.31	29.16
Percent with University Degree	460	18.00	11.29	5.88	60.75
Unemployment Rate	460	12.92	9.26	2.69	40.99
Percent Immigrant	460	7.87	10.33	0.11	60.68
Percent Low Income	460	16.95	7.70	4.05	58.63
Percent Christian	460	72.45	15.76	21.76	96.60

Note: Thousands of 2014 dollars. One observation per charity, averaged over all years. All measures in Panel A are from the T3010 Charity Information Return. All other measures in Panel B are from the Canadian census.

Table 2.2: Summary Statistics for Managers

	Obs	Mean	S.D.	Min	Max
Panel A: Manager Summary Statistics					
Total Years in Sample	1103	7.7	5.6	1.0	23.0
Mean Number of Years per Location	1103	4.0	2.3	1.0	21.0
Number of Different Locations	1103	2.2	1.4	1.0	8.0
Panel B: Charity Summary Statistics					
Number of Years	460	19.4	5.2	3.0	23.0
Number of Different Managers	460	5.4	1.8	1.0	12.0
Mean Length Between Changes in Managers	460	3.8	1.3	1.3	11.5

Note: Panel A 1 observation per manager, Panel B 1 observation per charity. Measures calculated by author.

Table 2.3: Predicting Changes in Leadership

	(1)	(2)
Total Revenue Change	-0.0633**	-0.0627**
	(0.0267)	(0.0267)
1st Lead		0.0084
		(0.0427)
1st Lag		0.0493
		(0.0673)
Private Donations Change	0.0127	0.0128
	(0.0087)	(0.0087)
1st Lead		0.0045
		(0.0106)
1st Lag		0.0217***
		(0.0031)
Government Revenue Change	0.1743	0.1737
	(0.1420)	(0.1442)
1st Lead		0.2021
		(0.1397)
1st Lag		-0.1306**
		(0.0570)
Program Expenditure Change	0.0319***	0.0316***
	(0.0077)	(0.0075)
1st Lead		-0.0076***
		(0.0026)
1st Lag		-0.0121**
		(0.0055)
Controls	Y	Y
Observations	8,909	8,909
R-squared	0.0080	0.0093

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2.4: Baseline Estimates

	Total Revenue (1)	Private Donations (2)	Government Revenue (3)	Donations from Other Charities (4)	Program Expenditures (5)
Standard Deviation	0.558	0.523	0.461	0.726	0.672
Adj Standard Deviation	0.516	0.442	0.397	0.687	0.635
10th Percentile	-0.313	-0.442	-0.229	-0.398	-0.319
Median	-0.018	-0.011	0.000	-0.034	-0.010
75th Percentile	0.121	0.161	0.083	0.136	0.144
90th Percentile	0.405	0.465	0.222	0.447	0.474
75th - Median	0.139	0.172	0.084	0.170	0.155
P-value on F-test	0	0	0	0	0
Number of Managers	1103	1103	1103	944	1103
Number of Charities	460	460	460	445	460

Notes: Coefficients are measured in standard deviations. The F-test is of the joint significance of all the manager fixed effects. Standard errors are clustered at the charity level.

Table 2.5: Kolmogorov-Smirnov test p-values

	Obs	Total Revenue	Private Donations	Government Revenue	Donations from Other Charities	Program Expenditures
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Married Couple or Individual						
Equality of Distribution		0.006	0.018	0.042	0.016	0.016
Married Couple Smaller	782	0.003	0.295	0.021	0.008	0.004
Individuals Smaller	321	0.481	0.009	0.367	0.068	0.030
Panel B: Gender						
Equality of Distribution		0.002	0.111	0.007	0.027	0.002
Female Smaller	204	0.001	0.056	0.003	0.013	0.001
Male Smaller	117	0.852	0.932	0.939	0.745	0.963

The observations column reflects the number of managers in the sample with this attribute. Fixed effect estimates are from the baseline specification.

Table 2.6: Match Effects

	Total Revenue (1)	Private Donations (2)	Government Revenue (3)	Donations from Other Charities (4)	Program Expenditures (5)
Panel A: *Baseline Estimates*					
Adj Standard Deviation	0.516	0.442	0.397	0.687	0.635
Panel B: *No Charity Fixed Effects*					
Adj Standard Deviation	0.886	0.591	0.561	0.841	0.867
Difference from Baseline	0.370	0.149	0.164	0.154	0.233
Number of Managers	1103	1103	1103	944	1103
Number of Charities	460	460	460	445	460
Panel C: *Charity-Manager Fixed Effects*					
Adj Standard Deviation	0.978	0.690	0.574	0.806	0.986
Difference from Baseline	0.463	0.249	0.177	0.119	0.351
Number of Charity-Manager Observations	2474	2474	2474	1990	2474

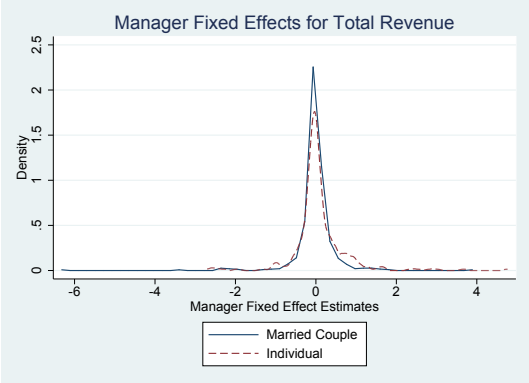
Notes: Coefficients are measured in standard deviations. Standard errors are clustered at the charity level

Table 2.7: Persistence of the Effect of Managers

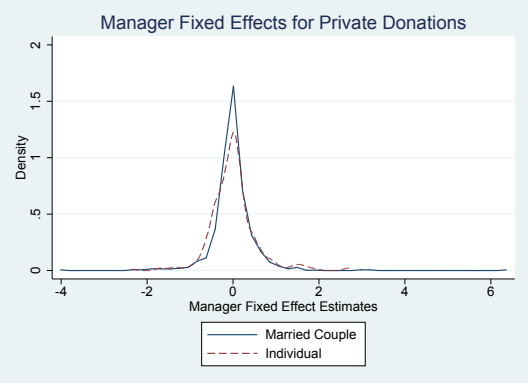
	Total Revenue (1)	Private Donations (2)	Government Revenue (3)	Donations from Other Charities (4)	Program Expenditures (5)
Panel A: Baseline					
Adj Standard Deviation	0.516	0.442	0.397	0.687	0.635
Panel B: 3 Year Decay					
Adj Standard Deviation	0.442	0.617	0.381	0.583	0.581
Difference from Baseline	-0.074	0.175	-0.015	-0.104	-0.054
Panel C: 4 Year Decay					
Adj Standard Deviation	0.431	0.616	0.394	0.647	0.571
Difference from Baseline	-0.085	0.174	-0.003	-0.040	-0.063
Number of Managers	1103	1103	1103	944	1103
Number of Charities	460	460	460	445	460

Notes: Coefficients are measured in standard deviations. Standard errors are clustered at the charity level

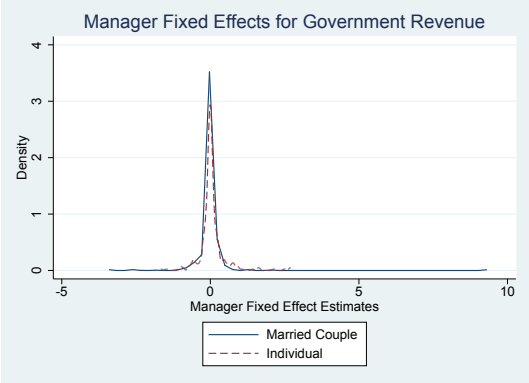
Figure 2.1: Kernel Density Distributions for Manager Fixed Effects for Individuals vs. Married Couples



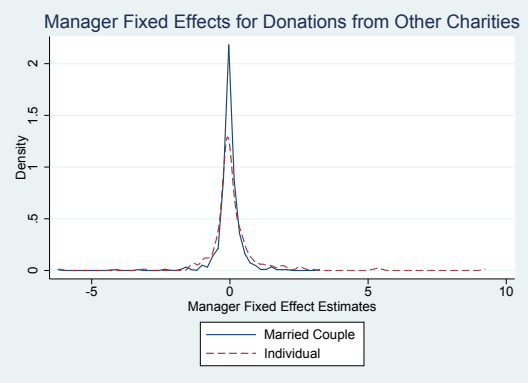
(a) Total Revenue



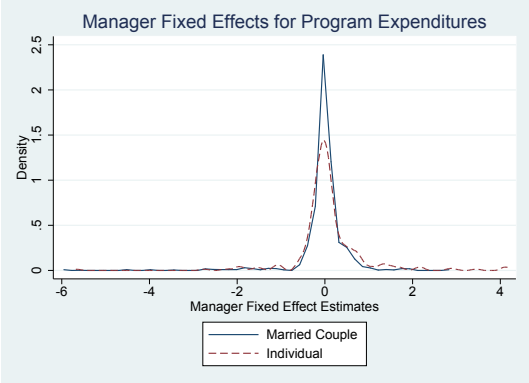
(b) Private Donations



(c) Government Revenue

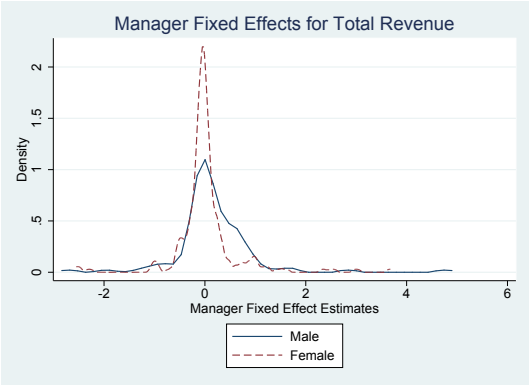


(d) Donations from Other Charities

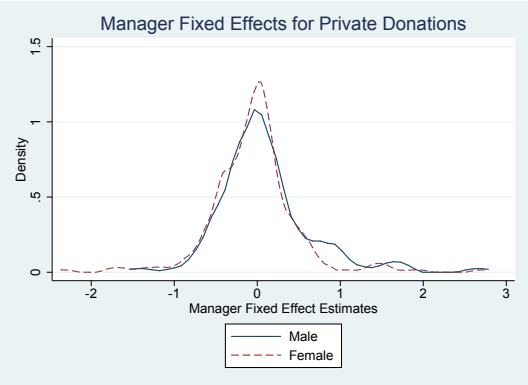


(e) Program Expenditures

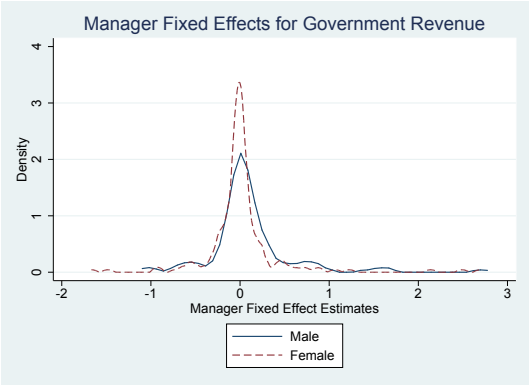
Figure 2.2: Kernel Density Distributions for Manager Fixed Effects by Gender



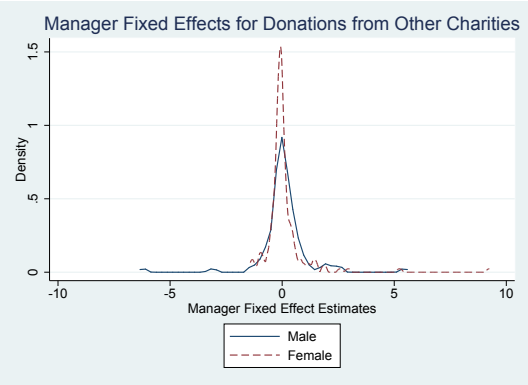
(a) Total Revenue



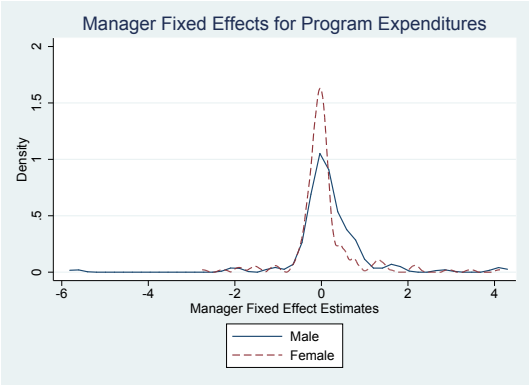
(b) Private Donations



(c) Government Revenue



(d) Donations from Other Charities



(e) Program Expenditures

2.9 Theory Appendix

$$\sum_{s=1}^{S}(1-z_{s_j}^i)R_s(q^*) = c_{i,j}q^* \tag{2.9}$$

First take the total derivative

$$\sum_{s=1}^{S} R_s'(q^*)dq^* = c_{i,j}dq^* + q^*dc_{i,j} + \sum_{s=1}^{S} R_s(q^*)d + \sum_{s=1}^{S} z_{s_j}^i R_s'(q^*)dq^* \tag{2.10}$$

$$[\sum_{s=1}^{S} R_s'(q^*)(1-z_{s_j}^i) - c_{i,j}]dq^* = q^*dc_{i,j} + \sum_{s=1}^{S} R_s(q^*)dz_{s_j}^i \tag{2.11}$$

Now want to find $\frac{dq^*}{dc_{i,j}}$ so $dz_{s_j}^i = 0$

$$[\sum_{s=1}^{S} R_s'(q^*)(1-z_{s_j}^i) - c_{i,j}]dq^* = q^*dc_{i,j} \tag{2.12}$$

$$\frac{dq^*}{dc_{i,j}} = \frac{q^*}{[\sum_{s=1}^{S} R_s'(q^*)(1-z_{s_j}^i) - c_{i,j}]} \tag{2.13}$$

$$\tag{2.14}$$

It follows that, $\frac{dq^*}{dc_{i,j}} < 0$ (since $q^* > 0$) and $\sum_{s=1}^{S} R_s'(q^*)(1-z_{s_j}^i) - c_{i,j} < 0$

Next look at how $c_{i,j}q^*$ is affected by $c_{i,j}$

$$c_{i,j}q^*(c_{i,j}, z_{1_j}^i, ..., z_{S_j}^i)$$

Take the derivative wrt $c_{i,j}$

$$q^* + c_{i,j}\frac{\partial q^*}{\partial c_{i,j}}$$

sub in the value for $\frac{dq}{dc_{i,j}}$

$$q^* + c_{i,j}\frac{q^*}{[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}]}$$
$$\frac{q^*[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}] + q^* c_{i,j}}{[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}]}$$
$$\frac{q^* \sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j})}{[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}]} < 0$$

Since the denominator is negative, and the numerator is positive then the whole term is negative

This means that as $c_{i,j}$ rises, $c_{i,j}q^*$ falls. So a good manager, (one with a lower $c_{i,j}$) will have a higher value of $c_{i,j}q^*$

Now want to see how the level of each $z^i_{s_j}$ affects q^*

$$[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}]dq^* = q^* dc_{i,j} + \sum_{s=1}^{S} R_s(q^*)dz^i_{s_j} \tag{2.15}$$

$$\tag{2.16}$$

We set $dc_{i,j} = 0$ and this solve for some s=S

$$[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}]dq^* = R_S(q^*)dz^i_{s_j} \tag{2.17}$$

$$\frac{dq^*}{dz^i_{s_j}} = \frac{R_S(q^*)}{[\sum_{s=1}^{S} R'_s(q^*)(1-z^i_{s_j}) - c_{i,j}]} \leq 0 \tag{2.18}$$

This will only be zero if the revenue from that source is zero, otherwise this is negative.

Again, since a good manager will have a smaller $z^i_{s_j}$ then this means that a better manager will have a higher q^*. This means that whether we measure the effect of the

manager through $z^i_{s_j}$ or through $c_{i,j}$ that it has the same effect, leading to a larger value for q^*. Since $R'(q) > 0$, then we can measure the quality of a manager by the level of $R(q^*)$.

Chapter 3

The Sensitivity of Charitable Giving to the Timing and Salience of Tax Credits

3.1 Introduction

Most developed countries use the tax system to encourage giving to charity. In some countries, like the US, these incentives are in the form of a deduction against one's taxable income. In other countries, like Canada, a credit against the donor's computed tax liability is offered. Although this is an incentive for the savvy taxpayer, these incentives require a tax filer to recall her donations and to recognize that incentive at the time of filing her return. For example, in the US and Canada, for tax returns filed in April of year t, one may only report donations made in the previous calendar year (t-1). Does a lag of four to sixteen months reduce the full potential of the tax incentive?

Previous research has focused on measuring the permanent and transitory effects

of a change in the tax price of giving on gifts to charities (see, e.g. Randolph (1995) and Auten, Sieg, and Clotfelter (2002)). While most authors find a tax price effect on giving, giving as a share of GDP has been relatively flat for decades which leads to question whether tax incentives alone can help increase giving. Are there other mechanisms that may induce greater giving? This paper focuses on the effect on giving behaviour of the timing between when a gift is made and when it is reported on one's tax return. If taxpayers react to better information about the tax price of giving (more salient price), then creating a closer link between the timing of a donation and the reporting of a donation on the tax return could lead to differences in both the number of taxpayers reporting donations and the level of donations to charity.

We study the sensitivity of charitable giving to the salience and timing of tax incentives by exploiting a natural experiment after the Haitian earthquake of 2010. The earthquake occurred on January 12^{th}, near the time when taxpayers in Canada begin preparing their tax returns for income earned in the previous year. Under other circumstances, all donations to support the relief efforts would be reported one year later, when filing the 2010 tax return in April 2011. One province, Quebec, changed this practice and announced that tax filers could report their donations in support of the relief efforts on their 2009 tax return, effectively changing the timing of reaping the benefits of the credit as well as increasing the awareness that the donations could be reported on one's tax return, especially at the time when most individuals were preparing their returns.[1] This created a difference in the treatment of donations by those residing in Quebec and those residing in the rest of Canada. Thus, the Quebec provision provides an arguably clean identification strategy for

[1]Normally, only donations made during the tax year (January 1 to December 31) are allowed to be included. For example, when preparing the 2008 tax return in March or April of 2009, only donations made between January 1 and December 31, 2008 can be included.

studying how the timing of when a donation is made and when it is reported can affect charitable giving. While the US enacted a similar provision, an analysis of the US provision would be empirically challenging given it applied to tax filers in all states and, in particular, to only those tax filers who chose to itemize their deductions (Congress (2010)).

The Quebec policy experiment provides us with within country variation in tax incentives, allowing us to test the efficacy of this kind of policy. In addition to changing the timing of the reporting of donations, Quebec's policy increased the visibility, or salience, of the tax credit since through advertising the earlier credit, the government is also advertising that there is a tax credit for donations.[2] Moreover, unlike the US where the tax benefits for donations are tied to itemizing deductions, tax credits for giving are available to all Canadian tax filers provided they incur a tax liability.[3] The value of the credit is tied to the level of the donation, not the tax bracket of the tax payer.

A potential threat to identification, or the use of the event as a natural experiment, would be if the reaction to the Haiti earthquake by Quebec residents differed from those residing in the rest of Canada given Haiti is a French speaking country a characteristic observed in Quebec but not necessarily in all other parts of Canada. Canada, like the US, has been a longtime supporter of Haiti. At the federal level, Canada reacted to the earthquake by announcing a federal government match of donations to a set of charities providing relief efforts in Haiti soon after the devastation of the earthquake became apparent (post January 12^{th}) and continued this match for a 30 day

[2]Results from a survey conducted in May 2010 of donors to an online giving portal suggests that the tax incentive was in fact salient to donors from Quebec. 28.3% of respondents from Quebec were aware of the extra incentive to donors in Quebec, compared to only 1.8% of respondents from the rest of Canada.

[3]According to Clemens, Veldhuis, and Murphy (2013) 62.3% of Canadians had a positive tax liability in 2010.

period (Government of Canada (2010)). Donations across Canada poured into many of the key charities responsible for delivering relief efforts. Below we provide evidence that support for Haiti was by all Canadians and not just French speaking Canadians. Moreover, under our preferred specification, we study Quebec neighbourhoods that were mostly English speaking and, thus, less susceptible to a "Haiti" effect due to an allegiance to French speaking countries. This is because our matching estimator matches the neighbourhoods in the rest of Canada based, in part, on the language spoken at home, resulting in neighbourhoods that are mostly English speaking to be matched across provinces. Specifically, we employ a propensity score matching estimator that uses characteristics of neighbourhoods to predict whether they are in fact located in the province of Quebec, and thus subject to the eligibility of claiming their tax credits for donations to Haiti earlier than those in the rest of Canada. This procedure allows us to compare neighbourhoods in Quebec that are similar to neighbourhoods located in the rest of Canada in terms of characteristics that would be strong predictors of giving in general and giving to Haiti in particular.

Earlier eligibility for tax credits effectively reduces the price of giving as this reduces the period a donor must wait to receive the tax benefit from her gift and it should increase giving on both the intensive and extensive margins. An additional effect of changing the timing of donations is that by linking the timing of the donation to the timing of preparing a tax return, a taxpayer will be better informed about her tax liability and that could lead to making more informed decisions around charitable giving which could lead to an increase or decrease in giving depending on one's perception of their tax liability prior to completing a return and the actual level of the liability. Thus, if the deadline for reporting charitable donations were tied to the timing of when one is preparing one's tax return, we should expect there to be both salience, and timing effects. Our study assesses the overall effect of a potential policy

to change the timing of when charitable donations are reported using the Quebec natural experiment.[4]

We find that the Quebec incentive had a meaningful effect on all measures of donation activity. The incentive increased the share of households reporting a charitable donation by 2 percentage points. For the 2008 tax year, approximately 25% of Canadian tax filers reported donations on their tax return. Thus extending the incentive to all of Canada would increase substantially the reporting of donations. We also find that the average donation per donating household increased by 7 to 9 percentage points. These results point to both an increase in reported giving along both extensive and intensive margins.

The rest of the paper proceeds as follows: in section 3.2 we provide details of the natural experiment we exploit and details of how charitable donations are treated under the Canadian tax code. Section 3.3 reviews the current literature on the tax-price of giving and tax salience and provides predictions for the effect of this natural experiment. Section 3.4 describes the data and the estimation strategy. Section 3.5 presents the analysis and section 3.6 concludes.

3.2 Tax Credits and 2010 Incentives for Supporting Haiti Earthquake Disaster Relief

In Canada, donations made to registered charitable organizations are eligible for non-refundable provincial and federal tax credits. Reporting donations to claim the tax credit takes place on Schedule 9 of the provincial and federal returns. If a tax filer files a paper return all documentation in the form of receipts must be submitted to

[4]In both Canada and the US proposals have been made to extend the deadline for charitable donations to be closer to when taxpayers file their taxes, though neither have been successful as of this writing. See House of Commons (2012) and Congress (2014).

Canada Revenue Agency. However, if a tax filer files electronically she must simply keep their receipts for up to six years in case there is a request by the tax authority. The value of the tax credit depends on the level of the donation not on the taxpayer's income. The credit is non-refundable and there are rules concerning the maximum credit available in any given year (typically 75% of reported income). Unused tax credits for donations can be carried forward for up to five years.[5] Figure 3.1 reports the rates for the tax credits available across provinces for the 2010 tax year. At both the federal and provincial levels the tax credit is two-tiered and is roughly tied to the minimum and maximum marginal tax rates assessed on income with Quebec, Alberta, and British Columbia being the exceptions. The first tier is for donations of less than $200 and the second tier is for donations greater than $200. Couples file separate returns but either spouse can claim any donations made by them or their spouse and donations are typically reported by only one spouse given the two tiered credit. At the federal level the credit is 15% on the first $200 of donations, and 29% for amounts exceeding $200. Across the provinces, Quebec has the highest credit for both tiers followed by Alberta, Saskatchewan, and Nova Scotia. The largest province, Ontario, provides some of the lowest credits.

The January 12^{th}, 2010 Haiti earthquake caused significant destruction with an estimated total damage at between 8.1 and 13.9 billion US dollars, along with 250,000 deaths (Cavallo, Powell, and Becerra (2010)). The vast extent of the damages and the large death toll appear to have been exacerbated by poor construction practices in Haiti (Bilham (2010)). Governments from around the world implemented policies to encourage donors to contribute to the relief efforts. The Financial Tracking Service, indicates that just over 100 countries made donations to the relief efforts, along

[5] A tax filer may carry forward the tax credits from donations for up to five years. This may be done if the tax filer has no tax liability in a given year or if their donations exceed the maximum allowed.

with numerous international organizations and private individuals and organizations (Financial Tracking Service (2016)).

In the US, President Obama signed the Haiti Assistance Income Tax Incentive Act (Congress (2010)) on January 22, 2010, allowing taxpayers to claim donations made to organizations providing relief efforts in Haiti between January 12, 2010 and February 28, 2010 on their 2009 tax return. The Canadian federal government announced that it would match donations to the Haiti relief efforts between January 12, 2010 and February 12, 2010 (Government of Canada (2010)) but made no provision to permit the claiming of a donations on the 2009 return.[6]

Unique about the Haiti earthquake response is that Quebec, the 2nd largest province also created an extra incentive for giving to disaster relief. Quebec permitted tax filers to report their donations to the relief effort on the provincial portion of their 2009 tax return as opposed to waiting for their 2010 tax return. This unilateral action by Quebec permits us to compare donations from Quebec with donations from the rest of Canada.

3.3 Tax Salience and the Timing of Giving

Although donations for Haiti were made at the same time by all donors, the Quebec incentive allowed Quebec residents to recognize the donation a year earlier and near the time of the event, whereas residents of other provinces did not obtain their credit until the following year. The Quebec policy affected tax filers under two primary mechanisms. The first is through a price effect since donors in Quebec could claim the tax credit a year earlier than the rest of Canada, a Quebec taxpayer's discounted

[6]Both Canada and the US extended the reporting window for donations associated with relief efforts for the December, 2004 Indian Ocean Tsunami, permitting donors to give into January but still report the donations made for the Tsunami relief effort on the 2004 tax return. Canada also provided matching funds for the Tsunami. Government of Canada (2005)

benefit from the tax credit was larger, which effectively lowered the price of giving relative to taxpayers residing outside of Quebec. Intuitively, when the price of a good is reduced, consumers will purchase more of that good, meaning that we would expect to see both more donors and larger donations per donor in Quebec than in the rest of Canada for the period covered by the Haiti relief effort.[7]

There have been numerous studies on the effect of the tax-price of giving on donations, two of the most prominent being Auten, Sieg, and Clotfelter (2002) and Randolph (1995). Auten, Sieg, and Clotfelter (2002) shows that removing the tax deduction for charitable contributions in the US would decrease donations by 25 to 36 percent. Randolph (1995) shows that responses to transitory price changes are larger than the responses to permanent price changes. More recently, Bakija and Heim (2011) use data from the US from 1976-1996 and 1999-2005 to estimate the price elasticity of giving. They find estimates of the transitory price elasticity in the range of -0.7 to -0.9. In all of this literature, the uncertainty surrounding the permanence or temporary nature of tax changes creates a problem for estimating the elasticity of giving. Individual donor reactions to changes in tax price depend on a number of factors including: whether they expect the price change to be temporary or permanent; and their expectations over their future earnings. This problem is absent in our study as the sudden change in the timing of the tax credit eligibility is clearly a transitory event and is plausibly uncorrelated with donor expectations over their future stream of income.

The above referenced studies focus on US taxpayers where donations are eligible for a tax deduction as opposed to a tax credit. Fack and Landais (2010) examine the tax-price of giving in France, where donations are eligible for non-refundable credits

[7]This is of course assuming that charitable giving is a normal good, which past work has shown to be true (see Auten, Sieg, and Clotfelter (2002) for example).

in a similar manner to Canada. Fack and Landais (2010) exploit a tax reform and the fact that in France a household's status as taxable or not depends on the number of people in the household. This enables them to study treatment and control groups with the same levels of household income when evaluating a change in the generosity of tax credits. They estimate that the price elasticity of giving ranges from -0.2 to -0.6. Like Bakija and Heim (2011) they also find evidence of heterogeneity of the responsiveness of giving to tax price changes. Our study complements this research on the price of giving by addressing the timing of the realization of the tax incentive.

Along with changing the effective tax price, the second mechanism driving a difference in the effect of the Quebec policy is through an increased salience of the tax credit. Following Bordalo, Gennaioli, and Shleifer (2013) we consider a characteristic of a good to be more salient if an individual's attention in drawn more to that particular characteristic than to other characteristics of the same good. In this sense, the tax price of giving in Quebec would be more salient than the tax price of giving in the rest of Canada because the announcement of the ability of residents to claim their tax credit early in Quebec would draw more attention to the existence of the tax credit. The policy change that we are considering was officially announced through a Government of Quebec press release (2010) that was subsequently picked up by several major media organizations. Bordalo, Gennaioli, and Shleifer (2013) present a model that produces large responses to unanticipated changes in the price of a good, as large changes in the price make the price more salient. Chetty, Looney, and Kroft (2009) show that the more salient is a tax, the more consumers react. The authors use two different settings to measure the effect. The first is done through an experiment where the tax inclusive price is shown on the sticker price of the good. The second involves looking at how consumers react to the excise (included in price) and sales taxes (added at register) on alcohol. They show that consumers react less to

sales tax changes, which are less salient, than they do to equivalent changes in excise taxes, which are more salient.

Turning to charitable giving, Goldin and Listokin (2014) study the salience of the charitable tax deduction in the US directly with a survey of tax filers. Goldin and Listokin (2014) refer to salience as cognition; with a tax deduction being less salient the greater is a tax filer's error in understanding their ability to benefit from the deduction. Goldin and Listokin (2014) find that of the eligible tax filers they surveyed just over half were aware of the deduction and the majority of those underestimated its magnitude. Ours is the first to study the effect of an unanticipated shock to the salience to the tax price of charitable giving.

Increased salience of the tax price of giving in Quebec would increase donations in two ways. First, we would expect that those making a contribution to a charity would increase the magnitude of their gifts since an increase in salience of the tax price lowers the perceived price of the donation (intensive margin). In addition we would expect that an increase in the salience would cause some givers who have never reported their donations on their tax returns to now claim their donations on their individual tax return or those that were not going to give to now give, since again the perceived price of the gift is lower (extensive margin). Each of these effects would lead to a positive effect of the policy on giving.

3.4 Data and Estimation Strategy

3.4.1 Data and Core Measures of Giving

Our data are derived from the federal individual tax returns for all tax filers in Canada, aggregated to the household level. We use household level data since dona-

tions made by one spouse can be claimed by either spouse, and since the credit is two-tiered we would expect only one spouse to claim all donations for the household. Donations for the Haiti relief effort would have been made at the same time across Canada, and ideally we would like to observe only the donations to Haiti at the time funds were being collected. Such data are not available. Instead we can observe the donations that are reported on tax returns and that would benefit from the tax credits offered by the federal and provincial governments. We observe all donations as reported by tax filers on their tax returns.[8] Because the timing of reporting donations to Haiti was different in Quebec than in the rest of Canada we must use the information reported on both the 2009 and 2010 tax returns to capture donations from all of Canada directed to Haiti relief efforts. A critical assumption underlying the use of donations summed over a two year period is that giving for other causes did not differ across the provinces over this period in any systematic way. There are typically disasters and other random events that seek private donations. To illustrate this point, Table 3.6 provides a listing of events for which the Canadian Red Cross created a special appeal for funding. In 2010, a second major disaster that could have affected giving was the Pakistani floods in the summer of 2010. And throughout the period of our analysis, most notably in 2009 and 2010, Canadians were experiencing

[8]In all provinces except Quebec, the tax filer submits information for provincial and federal taxation on one form and to the federal government. In Quebec, the tax filer submits the federal return to the federal government and the provincial return to Quebec. Technically, the Quebec policy only applied to the provincial tax return. However, Schedule 9, where the charitable donation tax credit was claimed, includes no reference to donations for the Haiti relief efforts on either of the provincial or federal tax returns. Moreover, news media through the federal government's Canadian Broadcasting Corporation and the province of Quebec's own information bulletin publicizing the policy do not make the distinction between making a claim on the provincial return only and not the federal return (see Government of Quebec (2010) and CBC (2010)).Thus a resident of Quebec could easily have mistakenly claimed the credit on their 2009 federal return, as the amount claimed on the provincial return was exactly equal to the amount claimed on the federal return in all previous years. Based on our investigation we have concluded that most likely Quebec tax filers did not appreciate this nuance in the policy and reported their Haiti relief donations on their 2009 tax return. By aggregating the 2009 & 2010 tax years together our results are unaffected by residents possibly filing in the wrong year.

the effects of the "Great Recession". Neither of these events were given specialized tax treatment for donations.

We believe the biggest concern from using a two year period might be if there was a differential reaction across provinces to supporting relief efforts from the Pakistani floods versus the Haitian earthquake based on differences tied to ethnicity. To illustrate using an extreme example, if we make a very strong assumption that only donors of Pakistani descent donated to charities providing relief for the floods and those donors were only located in Quebec we might observe greater giving in Quebec for both Haiti and Pakistan and attribute this increased giving to the tax incentives given for Haiti. Based on the 2006 census, the size of the Pakistani population in Canada is approximately the same size of the Haitian population in Canada, less than 0.5 percent of the Canadian population. The bulk of immigrants from Pakistan reside in Ontario (91,000), followed by Quebec (12,000) and Alberta (11,000). If there was a greater reaction in terms of tax receipted giving in Ontario for Pakistan than for Haiti, then we would observe greater overall giving in Ontario for 2010 and our failing to account for this would mean that our estimates would understate the effect of the Quebec policy on donations.[9] The data from the tax returns were aggregated by Statistics Canada up to the geography known as the forward sortation area ("FSA") which captures the first three characters of the postal code. The FSA is a geography created by Canada Post and is designed to capture the area that can be covered by a postal worker. It serves as a good proxy for a neighbourhood in that the boundaries typically follow natural (rivers, ravines, etc.) and artificial (highways, major roads) contours. A typical FSA covers approximately 7,000 households. Data at this level of geography are only available for urban areas. In Canada, almost all

[9]Although not reported in our results, a robustness check of our analysis included shares of the population that are identified as Pakistani. Including this measure as one of the matching indicators did not change the results substantially.

adults file a tax return, even those with low or no income because of the availability of refundable tax credits which includes such things a child benefit tax credit, a working income tax credit, and a sales tax credit. Moreover, all tax filers can easily report their giving as donations generate non-refundable tax credits versus a deduction off one's income as would be observed in the US. We supplemented the data from the tax returns with information from the 2011 Canadian National Household Survey to capture socio-demographic information at the neighbourhood (FSA) level such as average household income, house prices, share of the population considered low income, and demographic characteristics of the population (ethnicity, language, immigration status, age, religion).[10]

Our core measures of interest are derived by using a two year sum of the number of households, number of donating households and level of donations reported. We created three measures for use in our preferred estimation strategy, propensity score matching:

- percentage change in the share of households reporting donations from the 2007/08 to the 2009/10 periods (extensive margin) ["change in share of donating households"];
- percentage change in the average donation per donating household from the 2007/08 to the 2009/10 periods (intensive margin) ["change in donations per donating household"];
- and the percentage change in the average donation per household from the 2007/08 to the 2009/10 periods ["change in donations per tax filers"].

[10]The 2011 Census has been criticised because the federal government made participation in the "long form" portion of the survey voluntary. Alternatively we could use characteristics of the neighbourhoods as they were know in the 2006 Census when the completion of the long form was mandatory. Results using these measures are available from the authors. The results are similar to those reported using the 2011 Census data.

We use a percentage change to capture the relative differences between the period for reporting donations for Haiti relief efforts and the period prior to the Haiti earthquake. As the tax credits and propensity for giving vary across provinces, our strategy is to compare reported giving in 2009/2010 tax years with the reported giving in the 2007/2008 tax years using this earlier period as a within province control. A critical assumption for using the 2007/08 tax year as a within province control is that other major events that could affect donations reported on the 2007/2008 tax returns resulted in similar behaviour across all provinces.

Similarly we might want to consider major disasters or events in our control period 2007 and 2008. Again we refer to the description of the events for which the Canadian Red Cross issued appeals that is provided in Table 3.6. 2008 is touted as a year of substantial disasters and there was no significant disaster in 2007. In 2008, two notable disasters included an earthquake in China (death toll of 88,000) and a cyclone in Myanmar (death toll 138,000). As discussed further below, the existence of these events provides further support for using a propensity matching estimation technique to allow us to match neighbourhoods based on demographic characteristics.

3.4.2 Threats to Measuring the Effect of the Tax Policy

A natural starting point in the analysis would be to compare our core measures for Quebec and the rest of Canada using a basic difference in differences strategy. One could extend the difference in difference strategy using an OLS framework to control for factors that might affect the propensity to give. The regression results, available from the authors, support the summary statistics differences in means as discussed below.

A core threat to the estimation is that characteristics of the neighbourhoods may

not be independent and the propensity to support Haiti relief efforts could be tied to the demographic composition of the neighbourhoods. Quebec residents differ from residents in the rest of Canada in that the residents of Quebec tend to be primarily French speaking, similar to Haiti citizens. Quebec and Haiti were two of the earliest French colonies in the Americas and therefore Quebec shares a greater cultural proximity to Haiti relative to the other provinces of Canada. In addition, Haitian citizens that immigrate to Canada have a greater likelihood of residing in Quebec, with 90% of Canadians with Haitian ethnicity living in Quebec in 2001 (Government of Canada (2007)). If French-speaking Canadians and/or Haitian immigrants were more likely to donate to the Haiti earthquake relief effort then we might be overstating the effect of the Quebec tax incentive policy on giving. What follows is an analysis to support that donations to support Haiti relief efforts was widespread. Ultimately, however, our propensity score matching will match neighbourhoods with similar cultural proximity to Haiti and thus account for any differences in how this proximity affects the reaction to the disaster.

We draw from a variety of data sources and arguments to justify our belief that support for Haiti relief efforts was widespread and not limited to French Canadians. First, there is support for the notion that given the geographic location and economic state of Haiti, giving to support the relief efforts was widespread. Canada was not the only country that gave incentives for giving to the Haiti relief efforts. For example, the United States also engaged in promoting substantial support for relief efforts despite a not as large French population in the US.

Second, relying on data from the charity tax returns filed with the Canadian Revenue Agency, we can show that giving across Canada was widespread and increased around the time of the earthquake. In Table 3.1, we report the levels of tax receipted giving for charities that self-identified as providing services in Haiti for at least one

year between 2009 and 2012.[11] In some instances a charity reported providing services in Haiti for all years; in other instances a charity reported providing services for some but not all years. In Table 3.1 we group the charities based on if they are a national organization or a local organization/chapter and whether the charity's address is in Quebec or a province other than Quebec. For each year and grouping we report the number of charities, the share of charities reporting activities in Haiti in that year and the total tax receipted gifts reported by all charities as well as the total gifts to the charities that were working in Haiti in that year. Note that for any given charity, only a portion of their donations may be used in Haiti. The charity information return does not allow us to isolate the donations that were given specifically to Haiti. Many charities may provide disaster relief to other countries, as would be expected by the national organizations such as Canadian Red Cross, Care, and UNICEF.

Across all groupings of charities, there is an increased presence of charities providing services in Haiti in 2010 and 2011. In Panel A, we report statistics for national organizations. There are a total of 186 national organizations that report they provide services in Haiti. Of these 24% are located in Quebec. The bulk of the tax receipted gifts to these charities were to the organizations located outside of Quebec. For the national organizations located in Quebec, there is no discernible difference in overall tax receipted giving in 2010/2011 compared to the other years. For the national organizations located outside of Quebec, there is a substantial increase in tax receipted giving in 2010 compared to the other years, an increase of nearly $30 million.

In Panel B of Table 3.1, we report statistics for local organizations and local chapters of national organizations that report providing services in Haiti. Of the 503

[11] The actual physical location of the charity is confidential and is not released by the CRA, but the data set contains an address that reflects either the address of the charity or the address where the information return was prepared. The authors have tested the address using a sample of these charities and found the address provided to be the actual physical location of the charity in most cases.

local organizations, 26% are located in Quebec. We observe for both geographies a substantial increase in the level of tax receipted gifts in 2010 with the bulk of the funding going to organizations located outside of Quebec. This information is suggestive that support for Haiti extended far beyond the borders of Quebec.[12]

Third, we examined data from the results of a survey of donors to a Canadian based online giving portal conducted in 2010 by the Public Economics Data Analysis Laboratory at McMaster University.[13] The giving portal is one that allows donors from across Canada to donate to any registered Canadian charity. The survey randomly sampled 170,354 donors and had a response rate of 10%. The response rate by Quebec residents was slightly lower at 8% and these donors represented 7% of the respondents. Most of the respondents resided in Ontario (55%). The survey was conducted in several batches from March to June in 2010, just after the Haiti earthquake. Respondents were asked whether they had donated to the Haiti relief efforts and whether they were aware of the tax policy for Quebec residents. Of the Quebec respondents, 62% reported giving to support the relief efforts and 29% reported being aware of the Quebec policy. In contrast, 58% of the rest of Canada respondents reported supporting the relief efforts and less than 2% were aware of the Quebec policy. While this survey is representative of donors who gave online and not necessarily of all tax filers nor of non-donors, the results from this survey are suggestive of overall support for the relief efforts and a greater awareness of the tax incentive for residents of Quebec.

[12] Anecdotally, there were news reports that shortly after the earthquake charities were flooded with donations, so much so their servers were on the brink of collapse. Donations flowed to big organizations such as World Vision Canada, Canada Red Cross, Care Canada, Oxfam Canada, Oxfam Quebec, Save the Children, Doctors without Borders, Humanitarian Coalition, Salvation Army, United Church, Canadian Conference of Catholic Bishops, and the Canadian Catholic Organization for Development and Peace, and so forth. See, e.g. CP24 (2010)

[13] While it is not clear how representative of the entire population of tax filers our survey respondents are, these data provide some evidence that donors from all across Canada responded to the Haiti earthquake.

3.4.3 Estimation Strategy

We are interested in estimating the effect of receiving the treatment of early tax credit for donations, T, on each of: the percentage change in households reporting donations, average donation per donating household, and average donation per household in each two-year interval for each neighbourhood (FSA). To this end we consider a regression of the following form:

$$D_{i,j,t} = f(X_{i,t}) + \delta T_{i,t} + \alpha_i + \epsilon_{i,t} \tag{3.1}$$

Where $D_{i,t}$ is one of our three measures of the percentage change in donation activity in FSA i, in year t. $X_{i,t}$ is a vector of control variables that determine donations; α_i are FSA fixed effects; and $\epsilon_{i,t}$ is a random error. $T_{i,t}$ is a binary indicator of the treatment of the more salient early tax credit and δ is the parameter of interest in our specification: the average treatment effect of an early tax credit on charitable donations. Since $T_{i,t} = 1$ for all FSAs in Quebec and $T_{i,t} = 0$ for all FSAs outside of Quebec we employ a research design of selection on observables through propensity score matching to address the potential that confounding factors associated with being in the province of Quebec may contaminate our estimate of the effect of early tax credits, δ. As there may be differences in the reaction to the Haiti earthquake by tax filers in these two regions due to cultural proximity, despite evidence that all of Canada supported the relief efforts, our primary analysis relies on a propensity score matching method. The advantage to this methodology is that we can match Quebec neighbourhoods with neighbourhoods outside of Quebec based on a set of observable characteristics ("matching measures"). For each set of matching measures we use propensity score matching to estimate the probability that a neighbourhood receives the treatment of an early tax credit:

$$T_{i,t} = g(X_{i,t}) + \mu_{i,t} \tag{3.2}$$

We wish to estimate the function $g(X_{i,t})$ which is the probability of being treated for province i in time t, that is the probability of $T_{i,t} = 1$. We control for characteristics of the neighbourhood that would influence both the overall level of charitable giving and the neighbourhood's response to the Haiti earthquake. When engaging in a matching technique it is important not to be exhaustive in the employment of measures to match, otherwise the set of neighbourhoods that can be matched will become very limited. We employ two groups of matching measures. The first group pertains to the income and housing prices of the neighbourhoods, factors that likely would make a resident more or less sensitive to the tax credits. We use four measures: the average household income, the average value of a house, the share of residents with a reported income greater than $100,000 and the share of residents classified as low income as defined by Statistics Canada.[14] The second group uses the measures in the first group and adds the share of residents identified as Haitian and the share of residents whose primary language is French. Thus, we will be matching neighbourhoods in Quebec with neighbourhoods outside of Quebec based on characteristics that might be tied to having or not having a closer affinity to Haiti. To obtain consistent estimates of δ from (3.1) we require the following identifying assumptions:

$$D_{i,t}(T_{i,t} = 0), D_{i,t}(T_{i,t} = 1)) \perp T_{i,t} | g(X_{i,t}) \tag{3.3}$$

$$0 < Pr(T_{i,t} = 1 | X_{i,t}) < 1 \tag{3.4}$$

[14] In Canada low-income-cutoffs are designated by Statistics Canada and vary across census metropolitan areas depending on the number of members of the household and the population of the census metropolitan area.

These are the "unconfoundedness (3.3) and"overlap (3.4) assumptions as found in G. W. Imbens and J. M. Wooldridge (2009).[15] We believe that these assumptions are reasonable in this context for two reasons. First, all FSAs in the rest of Canada did respond to the Haiti earthquake through the federal government's matching grant program. This demonstrates that all FSAs were likely to be influenced by policies designed to incentivize giving (3.3). Second, Quebec's decision to extend the window for reporting eligible gifts on the 2009 tax return while unique for the Haiti earthquake is not unique for other disasters. After the December 2005 Indian Ocean Tsunami, the federal government and several provinces (Quebec, New Brunswick, and Ontario) extended the window for reporting eligible gifts made in early 2006 on the 2005 tax return.[16] One could consider Quebec's decision to introduce such a policy as no more or less likely than the decision of another province to introduce a policy designed to increase donations to Haiti. What was unique about the policy environment in response to the Haiti earthquake was that the rest of Canada did not proceed with an extension of the window for eligible gifts for the tax credit at the same time that Quebec did.

Another aspect for the propensity matching methodology is to define a trim level, which defines the quality of matches of one neighbourhood to another. One of our concerns is matching the many neighbourhoods in Quebec with a high proportion of the population whose language spoken at home is French. If we do not observe similar neighbourhoods outside of Quebec, then our matching estimator could be weakened. Given the linguistic similarities between Quebec and Haiti, as raised above, if there is

[15]The unconfoundedness assumption means that conditional on the observables (our matching measures), the assignment to treatment is random. The overlap assumption means that there is an overlap in the distribution of the covariates between the treatment and control groups.

[16]The announcements of these provincial policies to extend the giving window can be found in the following references: Government of Quebec (2005), Government of New Brunswick (2005), and Government of Ontario (2005).

simply a greater likelihood of donating to the relief effort because of home language then we would overstate the effect of the tax incentive on giving. We therefore adopt three trim levels. The effects of these different trims for matching Quebec neighbourhoods is illustrated in Figure 3.2. For this figure, we group the neighbourhoods in deciles based solely on the share of the population whose home language is French. Over half of the neighbourhoods fall into the top decile, where 90 to 100% of the population's home language is French. If we use a wide ("low") trim method (.0001-.9999), most of the neighbourhoods are matched. Moving to a narrower ("medium") trim method (.05-.95), we continue to match most of the neighbourhoods where the French population is less than 70% but we start to lose the neighbourhoods with a high proportion of French speaking individuals. Finally, moving the narrowest trim ("high") (.1 - .9), as suggested by G. Imbens and J. Wooldridge (2007), we lose most of the neighbourhoods where French is the dominant language spoken at home. Thus, at our high trim, we are capturing mostly the behaviour of non-French speakers in our analysis. Using these trim levels provides confidence that our overlap assumption (3.4) is met.

3.5 Analysis

3.5.1 Summary Statistics

Table 3.2 reports the summary statistics for our four years of data on tax filings. All measures reported in this table and all tables are in real 2010 dollars. In panel A we report the average and standard deviation per neighbourhood for those in Quebec (columns 1-4) and for the rest of Canada (columns 5-8). Starting first with the number of households, the number of households ranges from 8,728 to 9,045 in Quebec with

a slightly higher numbers of households in the rest of Canada (9,084 to 9,456) and there is slightly more variation in the sizes of the neighbourhoods in the rest of Canada than in Quebec. Given that neighbourhoods in the rest of Canada include both the most and least populated provinces, this is not too surprising. There are slightly fewer households reporting donations in Quebec than in the rest of Canada and the average donation per household is also lower in Quebec than in the rest of Canada. In national surveys and other research on giving, there is a general consensus that giving in Quebec is typically lower than in many other provinces in Canada and we see this in Table 3.2 (see Reed and Selbee (2001)).

Our treatment period captures the recession experienced in many countries. Thus, instead of expecting donations to increase, we might expect donations to fall. In Quebec, the average reported donation falls less than in the rest of Canada. From 2007 to 2010, reported donations in Quebec are around $2 million and are relatively constant. In the rest of Canada, the average reported donation per neighbourhood falls by $0.6 million, from $7.2 million in 2007 to $6.6 million in 2008, continues to fall further to $6.1 million in 2009 and then rises slightly in 2010 to $6.5 million.

3.5.2 Difference in Means Estimates

Table 3.3 reports the statistics for the unconditional difference in means between Quebec and the rest of Canada. Across the neighbourhoods in Quebec, there is no change between the pre and post Haiti periods whereas in the rest of Canada there is a drop in the average share of tax filers reporting donations of 1% or a change of -4.2%. Conditioning on an individual donating, the average donation per household in Quebec fell 2.2% or an average of $14 versus a fall of $89 or 5.7% in the rest of Canada. We also observe a sizable difference in the average donation per household. In order

for a difference in difference estimator to be valid, the parallel trend assumption must hold. Figure 3.3 shows the pre-treatment years for all three measures. While there is some evidence that the parallel trend assumption holds for all three measures, the evidence is not overwhelming, so we move to a propensity score matching method of estimation for a more robust measurement of the treatment effect.

3.5.3 Propensity Score Matching

As discussed above, Quebec announcing a policy to recognize the donation on the 2009 tax return and the other provinces not making such an announcement may not be exogenous in that the government likely introduced the policy because they believed that it would resonate with their citizens. In this case the treatment is not randomly assigned. This leads us to use a propensity matching method, as discussed above. In Table 3.4, we report the summary statistics for the two groups of measures used to match neighbourhoods. In columns 1 and 2 we report the statistics for all Quebec and the rest of Canada neighbourhoods in our sample. In columns 3 and 4 we report the statistics for those neighbourhoods included in the analysis when we use a medium trim (0.05/0.95) in the matching algorithm. In columns 5 and 6 we report statistics for the high trim (0.1/0.9). In panel A we report the statistics for the measures that are used for our baseline analysis, focusing on measures that reflect household income and dwelling values. Overall, the average neighbourhood in Quebec has a lower household income and a lower dwelling value. We also observe there are fewer households with income greater than $100,000 but that the share of households identified as low income is only slightly greater in Quebec. In panel B, we report the summary statistics for measures capturing ethnicity and language. For the overall sample the average neighbourhood in Quebec has 1.2% Haitians compared to less

than 0.05% and the rest of Canada. In the trimmed sample, these averages go up for the rest of Canada and fall for the Quebec neighbourhoods. With respect to home language, not too surprisingly the share of the population whose home language is French is substantially higher in Quebec than the average share for neighbourhoods in the rest of Canada. In columns 3 and 4, we report the summary statistics for the neighbourhoods if we use the medium trim (.05-.95). The neighbourhoods that can be matched is 269 in Quebec and 108 in the rest of Canada. The Quebec neighbourhoods are poorer compared to the rest of Canada and we observe a narrowing of the difference between proportions of the population that are Haitian and/or French between the Quebec and rest of Canada neighbourhoods. In columns 5 and 6, we report the summary statistics for the neighbourhoods if we use a high trim (.1/.9). The number of Quebec neighbourhoods that can be matched falls to 104 and the averages of the measures for Quebec and rest of Canada neighbourhoods are much closer.

Figure 3.4 displays maps of neighbourhoods in Canada and by various regions within Canada. This map shows the neighbourhoods that are matched at each trim level, showing both the size and location of these neighbourhoods. As can be seen, a large number of the treated neighbourhoods are in either Montreal or the National Capital Region (Ottawa/Gatineau). In particular, the National Capital Region has many neighbourhoods, both in the treated and control groups. New Brunswick, Canada's only officially bilingual province has a large number of neighbourhoods included in the high trim level, while Vancouver and the Greater Toronto Area both provide many neighbourhoods in the low trim level, but few in the high trim level.

In columns 7 and 8 of Table 3.4, we report the coefficients from the probit estimates for the first stage results of our matching estimator. Including only the measures to reflect income and dwelling values, all variables appear to be important predictors of a neighbourhood's likelihood of receiving treatment, or in other words, the likelihood

of being in Quebec. When we include the additional measures to reflect ethnicity, and language spoken at home, all of the coefficients are significant at the 10% level except for average household income The important measures appear to be the average value of dwellings, the share of households with income greater than $100,000, the share of the population identified as Haitian.

Table 3.5 reports the results from the propensity score matching estimator.[17] In panel A of Table 3.5, we report the results from the analysis that compares giving in the period of the Haiti disaster (2009 and 2010) with giving in the period prior to the disaster (2007 and 2008). Columns 1 and 2 report the results when we use for matching those measures that reflect income and housing values. Using either the low or high trim method our results are fairly similar, most likely because the trimming does not reduce the number of neighbourhoods in Quebec that are studied by a substantial number. Starting first with the dependent variable that reflects the percent change in the share of households that are donors, there is approximately a 4% increase in the share of donors in Quebec relative to the rest of Canada. This suggests the policy affected the extensive margin of giving, by increasing the number of households reporting charitable donations. Moving next to the intensive margin, the increase in donations per donating household, the coefficient on the treatment effect is positive but not precisely measured. Overall, the combined effect of the two margins increased total donations in Quebec by an average of about 4% per household. Moving next to column 3 of panel A, we report the results when we employ a high trim (.1/.9) matching technique and use only the measures that reflect the pro-

[17]There are many ways we could calculate the treatment effect. The results are robust to the different methods. We report the results using an inverse propensity score weighting for the high and medium trim levels. As suggested by Robins, Ritov, et al. (1997) and G. Imbens and J. Wooldridge (2007), the double robustness of the inverse propensity regression adjustment model implies that if either the model for the propensity score or the regression model is correctly specified then the estimator of the treatment effect is consistent. For the low trim samples, we use bootstrapped standard errors from propensity score matching

portion of the population that are Haitian and the proportion of the population that speak French at home, our Group B matching measures. This reduces the number of Quebec neighbourhoods that are studied to 101. The estimated treatment effects on all three measures of giving are positive and statistically significant. These results suggest, overall, that there is a 3.3 percentage point increase in the share of households reporting donations, a 7.6 percentage point increase in donations per donating household, and a 10.4 percentage point increase in donations per household. The results of our preferred specification are reported in columns 4 to 6 of panel A. For these specifications the neighbourhoods are matched using neighbourhood income and housing values (Group A) as well as the measures for ethnicity and language spoken at home (Group B). Starting first with column 4, we use a low trim to match neighbourhoods, allowing us to match 376 Quebec neighbourhoods. For all three measures of giving, we observe no effect associated with the Quebec policy to permit the reporting of gifts for Haiti relief effort on the 2009 tax return. Using a medium (.05/.95) or a high (.10/.90) trim estimation strategy decreases the number of Quebec neighbourhoods that can be matched: 270 for the medium trim and 104 for the high trim. Using either trim there is approximately a 2 percentage point increase in the share of households reporting donations (extensive margin), between 7 and 9 percentage point increase in reported donations per donating household (intensive margin) and a 9-11 percentage point increase in the donations per donating household. Focusing on our third dependent variable, the change in donations per household in a neighbourhood, our analysis suggests an increase in giving of 9-11 percentage points is quite sizable. Reported giving per neighbourhood ranges from $2 million in Quebec to $6.5 million in the rest of Canada during this period. Thus an 11 percentage point increase in donations resulting from a policy change to allow taxpayers to report donations made closer to the time of filing would potentially increase giving by $605,000 per

neighbourhood in the rest of Canada and closer to $200,000 per neighbourhood in Quebec.

3.5.4 Robustness and Extensions

Our first robustness check uses a placebo test for a different periods of giving. In columns 1 and 2 we use the period 2007 to 2008 as our treatment and 2005 to 2006 as a control period. We chose this period to act as a placebo test of our key results. With respect to natural disasters, in 2005/06 the biggest disaster was the earthquake in Indonesia on May 27^{th}, 2006. In 2007 and 2008 there were various earthquakes and floods that affected various countries/continents, the worst being the earthquake in China that killed 80,000 people. We expect these events to not have a discernible differential effect between Quebec and the rest of Canada neighbourhoods with respect to reported tax receipted giving. Indeed, using either a medium or high trim to match Quebec neighbourhoods with neighbourhoods in the rest of Canada, we do not discern any statistically significant difference for our three measures of giving. Using a high trim, we observe a 2 percentage point increase in the share of households donating. Ideally our placebo test would produce a null effect, but this positive treatment effect is likely the result of an increase in the tax credit for residents in Quebec starting in 2006. Under a medium trim, there is a statistically significant increase in the intensive margin with respect to the percent change in donations per donating household and the percent change in donations per household. This could possibly be the result of heterogeneity in the response to changes in the tax treatment of charitable donations at the federal level over our period of study. The year 2006 saw gifts of publicly listed securities made fully exempt from capital gains taxation (Government of Canada (2015)). This dramatically reduced the price of giving for

donations of securities and would have had different effects in different neighbourhoods depending on the wealth holdings of residents. However, under a high trim, there is no statistically significant difference for the intensive margin, or the overall effect between Quebec and the rest of Canada. Finally, in Panel C of Table 3.5, we explore different periods around the time of the 2010 Haiti earthquake. In columns 1 and 2 we exclude the 2010 tax year and use instead the 2008 and 2009 tax years as the treatment for Haiti. This effectively includes donations in Quebec if there are donors who are erroneously claiming donations on their federal return in 2009 for the Haiti relief effort but excludes donations in the rest of Canada for this disaster. There is a significant increase in the percentage change in donations on the intensive margins when we employ the medium trim, but no effect on the intensive margin. When we use the high trim, we find an effect on the extensive but not the intensive margin. Relying on this period, however, would result in over stating the effect of the tax incentives given to Quebec residents as a result of the Haiti earthquake. In columns 3 and 4 of Panel C of Table 3.5 we explore the extent to which there are lasting effects of the Quebec policy for reporting donations for Haiti relief efforts on an earlier year's returns. Recall, the policy potentially drove a change in donating and reporting behaviour for two reasons. First was the immediacy / price effect from being able to report close to the time of the donation, which is purely transitory. Second was the salience aspect, increasing awareness about tax credits for giving. From a salience perspective, the policy could have lasting effects to the extent that once a tax filer understands the benefit of the tax credit she is more likely to pursue the use of the tax credit. Using both a medium and high trim for the matching of neighbourhoods, the results suggest there is a lasting effect, albeit modest, on the extensive margin, the share of tax filers reporting tax receipted donations. On average, there is a percentage change increase in the share of tax filers reporting tax receipted giving of

1.8 percentage points. We, however, do not measure a statistically significant effect on either the average increase in reported donations per donating household or donations per household.

3.6 Discussion and Summary

Do tax filers respond to announcements about the availability of tax credits for charitable giving around the time of the filing of one's tax return? Our analysis suggests yes. In January 2010, there was widespread devastation from an earthquake in Haiti. In response to the disaster, charitable donations and government support poured in from Canada and many other countries. Federally, the government of Canada announced it would match donations made by Canadians. The provincial government of Quebec enhanced the incentives for giving by permitting tax filers to report their support for relief efforts a year early, on the 2009 tax returns that were in the process of being filed at the time of the earthquake. This incentive both potentially nudged tax filers to give as well as increased awareness about the benefits of reporting donations on one's tax return. Studying charitable giving in Canada is ideal given all tax filers with positive tax liability can benefit from the tax credit and the tax credit is tied to the level of the gift versus the marginal tax rate of the filer. Because the residents of Quebec could report their donations for Haiti relief efforts in 2009 and the residents in the rest of Canada could not report their donations for these efforts until 2010, we group the information from tax filings using a two year period (2009 and 2010) and compare this information to that reported on tax filings for the period 2007 and 2008. Our preferred estimation strategy matches neighbourhoods in Quebec with neighbourhoods located outside of Quebec using measures that reflect income, house value, ethnicity, and the language spoken at home. Using the most

restrictive matching method, a trimming of .10 and .90, we study neighbourhoods where most of the residents do not speak French at home, potentially removing biases that might be associated with the fact that Haiti's dominant language is French. We find that giving increased both on an extensive and intensive margin. On average, the percentage change in the share of households reporting donations increased by 2 percentage points and the percentage change in the donations per donating household increased by 7-9 percentage points. This resulted in an observed increase in the percentage change in donations per household of 11 percentage points. While these numbers are suggestive of a tax price effect that is much larger than previous findings for the tax-price elasticity of donations, we feel that this can be explained by the increased salience of the tax credit. Chetty, Looney, and Kroft (2009) shows that individuals react much more to commodity taxes that are more salient, so our results are not unexpected given the large increase in the salience of the tax credit. Our analysis lends credibility to the potential effects from moving the period for reporting a charitable donation on one's tax return to one that coincides with the filing of the return. Given in most countries giving as a percent of GDP has remained relatively flat despite significant increases in GDP, a simple policy such as that studied in this paper could play a role in encouraging greater giving by tax filers. We have studied the timing and salience giving as it relates to a natural disaster. We leave for future study evaluating the effects of timing and salience on general giving.

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Table 3.1: Tax-Receipted Donations for Charities With Operations in Haiti

		2009 (1)	2010 (2)	2011 (3)	2012 (4)
Panel A: National Organizations Based on Location in Province					
Quebec	# of Charities	45	45	45	45
	Share Reported Conducting Activities in Haiti in the Given Year	48.9%	55.6%	66.7%	62.2%
	Total Tax Receipted Donations For All Charities (in $)	27.7 Million	14.9 Million	12.0 Million	10.7 Million
	Total Tax Receipted Donations For Charities With Haiti Operations in the Given Year (in $)	10.14 Million	6.99 Million	9.37 Million	8.93 Million
Rest of Canada	# of Charities	141	141	141	141
	Share Reported Conducting Activities in Haiti in the Given Year	46.1%	68.1%	68.1%	56.7%
	Total Tax Receipted Donations For All Charities (in $)	96.3 Million	106.4 Million	93.1 Million	87.5 Million
	Total Tax Receipted Donations For Charities With Haiti Operations in the Given Year (in $)	42.88 Million	72.04 Million	65.73 Million	51.55 Million
Panel B: Local Organizations and Chapters of National Organizations					
Quebec	# of Charities	129	129	129	129
	Share Reported Conducting Activities in Haiti in the Given Year	55.0%	73.6%	68.2%	63.6%
	Total Tax Receipted Donations For All Charities (in $)	22.0 Million	24.0 Million	22.7 Million	23.5 Million
	Total Tax Receipted Donations For Charities With Haiti Operations in the Given Year (in $)	13.8 Million	18.39 Million	17.58 Million	18.36 Million
Rest of Canada	# of Charities	374	374	374	374
	Share Reported Conducting Activities in Haiti in the Given Year	33.2%	60.7%	51.1%	50.8%
	Total Tax Receipted Donations For All Charities (in $)	128.24 Million	137.24 Million	127.55 Million	132.14 Million
	Total Tax Receipted Donations For Charities With Haiti Operations in the Given Year (in $)	31.57 Million	80.30 Million	64.61 Million	78.13 Million

Note: Dollars are real ($2010)

Table 3.2: Core Measures of Giving, Summary Statistics

	Quebec: 410 Neighbourhoods				Rest of Canada: 1181 Neighbourhoods			
	2007	2008	2009	2010	2007	2008	2009	2010
Panel A: Annual Statistics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Average Number of Tax Filer Households per Neighbourhood	8,728	8,833	8,923	9,045	9,099	9,243	9,353	9,456
(standard deviation)	(6,297)	(6,347)	(6,401)	(6,479)	(6,652)	(6,760)	(6,854)	(6,939)
Average Number of Donor Households per Neighbourhood	2,911	2,953	2,951	3,023	3,520	3,592	3,461	3,542
(standard deviation)	(2,127)	(2,145)	(2,120)	(2,171)	(2,698)	(2,755)	(2,659)	(2,729)
Average Donations ($1000s) per Neighbourhood	$2,109	$1,976	$1,935	$2,049	$7,212	$6,642	$6,194	$6,499
(standard deviation)	(3,386)	(3,106)	(3,006)	(3,349)	(8,556)	(7,829)	(7,453)	(7,281)

Notes: Neighbourhoods are defined based on the forward sortation area (first 3 characters of the postal code) and cover only urban areas.
Tax filer data from the Statistics Canada Summary of Charitable Donors. All dollars are in $2010.

Table 3.3: Comparison of Neighbourhood Donation Activity in Quebec v. Rest of Canada

Measures of Giving	Neighbourhoods	Quebec 410		Rest of Canada 1,181		Quebec-RoC
		Mean (1)	S.D. (2)	Mean (3)	S.D. (4)	(5)
Share of Households Donating	Pre-Haiti (07-08)	34.8%	(9.1)	39.4%	(10.3)	-2.5%
	Post-Haiti (09-10)	34.7%	(8.8)	37.9%	(10.0)	-1.5%
	Growth Rate	**-0.4%**		**-4.1%**		**3.7%**
Average Donation per Donating Household	Pre-Haiti (07-08)	$720.0	(1,118.4)	$1,920.4	(1,943.0)	-1,021.1
	Post-Haiti (09-10)	$712.2	(1,266.5)	$1,792.7	(1,721.1)	-945.7
	Growth Rate	**-1.1%**		**-7.1%**		**6.0%**
Average Donation per Household	Pre-Haiti (07-08)	$265.7	(563.8)	$796.0	(933.4)	-8,160.7
	Post-Haiti (09-10)	$257.7	(575.4)	$713.5	(789.7)	-7,306.7
	Growth Rate	**-3.1%**		**-11.6%**		**8.4%**

Note: All dollar figures in Real 2010 dollars

Table 3.4: Summary Statistics of Measures and First Stage Regression Details for Matching Neighbourhoods

	All Neighbourhoods		Neighbourhoods Used with Medium Trim (0.05-0.95)		Neighbourhoods Used with High Trim (0.1-0.9)		Point Estimates of Probit Regression for First Stage of Propensity Score Matching	
	Quebec	Rest of Canada	Quebec	Rest of Canada	Quebec	Rest of Canada	Group A Measures	Group A & B Measures
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of Neighbourhoods	410	1181	270	108	104	64		
Panel A: Group A Matching Measures								
Average Household Income	$37,647	$42,350	$37,853	$53,658	$41,836	$46,421	**0.039**	-0.012
	(11,014)	(13,925)	(11,750)	(29,849)	(16,338)	(20,649)	(0.008)	(0.011)
Average Value of Dwellings	$263,578	$360,643	$254,714	$533,663	$334,671	$487,000	**-0.002**	**0.001**
	(123,472)	(227,006)	(136,687)	(510,512)	(175,724)	(549,622)	(0.0003)	(0.000)
Share of Households with Income ¿ $100,000	3.86%	5.90%	3.81%	9.23%	5.72%	7.54%	**-0.098**	**0.071**
	(3.81)	(4.83)	(3.97)	(9.11)	(5.27)	(8.36)	(0.022)	(0.032)
Share of Households with Low Income	15.71%	13.87%	15.02%	14.91%	16.77%	15.53%	**0.023**	**0.019**
	(8.16)	(6.74)	(7.76)	(7.06)	(9.63)	(7.27)	(0.006)	(0.010)
Panel B: Group B Matching Measures								
Share of Population with Ethnicity Identified as Haitian	1.24%	0.05%	0.38%	0.24%	0.68%	0.34%		**0.737**
	(2.66)	(0.31)	(0.66)	(0.69)	(0.76)	(0.84)		(0.086)
Share of Population with Home Language as French	78.67%	5.97%	78.37%	38.96%	55.40%	43.30%		**0.047**
	(24.65)	(15.86)	(26.60)	(35.62)	(26.16)	(32.50)		(0.025)

Note: Matching measures all derived from the 2011 Canadian National Household Survey. Standard deviations reported in parentheses for columns 1-6; standard errors reported in parentheses in columns 7 & 8. High Trim uses a 0.1 / 0.9 trimming rule in the matching algorithm. Reported are the neighbourhoods used for matching. Coefficients in bold in columns 5 and 6 are statistically significant for p¡0.10

Table 3.5: Effect of Tax Incentives on Measures of Giving, Propensity Score Matching

Panel A: Core Analysis						
Sample Description	2007-2010 Haiti Group A Matching Measures		2007-2010 Haiti Group B Matching Measures	2007-2010 Haiti Group A & B Matching Measures		
Trimming Level	Low	High	High	Low	Medium	High
	(1)	(2)	(3)	(4)	(5)	(6)
Number of Neighbourhoods	1582	1401	154	1553	378	168
Number of Quebec Neighbourhoods	406	397	101	376	270	104
Dependent Variable						
% Change in Share of Households Donating	3.49%	3.82%	3.27%	-1.70%	1.71%	2.20%
	(0.000)	(0.000)	(0.000)	(0.410)	(0.008)	(0.000)
% Change in Donations per Donating Household	0.16%	0.87%	7.63%	-3.07%	7.39%	9.01%
	(0.891)	(0.326)	(0.008)	(0.562)	(0.010)	(0.001)
%Change in Donations per Household	3.49%	4.54%	10.42%	-4.39%	8.77%	10.90%
	(0.004)	(0.000)	(0.000)	(0.531)	(0.002)	(0.000)
Panel B: Robustness Checks: Period Before Haiti Earthquake						
Sample Description	Control: 2005/06 Treatment: 2007/08					
Trimming Level	Medium	High				
	(3)	(4)				
Number of Neighbourhoods	378	168				
Number of Quebec Neighbourhoods	270	104				
Dependent Variable						
% Change in Share of Households Donating	1.47%	2.33%				
	(0.131)	(0.017)				
% Change in Donations per Donating Household	6.47%	-2.63%				
	(0.056)	(0.552)				
%Change in Donations per Household	7.78%	-0.23%				
	(0.025)	(0.958)				
Panel C: Extensions: Periods Around Haiti Earthquake						
Sample Description	Treatment That May include Quebec Contributions to Haiti Control: 2006/07 Treatment: 2008/09		Period Subsequent to Haiti as Treatment Control: 2009/10 Treatment: 2011/12			
Trimming Level	Medium	High	Medium	High		
	(1)	(2)	(3)	(4)		
Number of Neighbourhoods	378	168	378	168		
Number of Quebec Neighbourhoods	270	104	270	104		
Dependent Variable						
% Change in Share of Households Donating	0.59%	1.94%	1.77%	1.68%		
	(0.513)	(0.001)	(0.001)	(0.006)		
% Change in Donations per Donating Household	13.86%	5.09%	-0.31%	-0.29%		
	(0.000)	(0.228)	(0.910)	(0.937)		
%Change in Donations per Household	14.05%	6.47%	1.58%	1.51%		
	(0.000)	(0.128)	(0.525)	(0.661)		

Notes: p-values in parentheses. The Trimming method for the estimations is defined as: Low: 0.01%/99.99%; Medium: 5%/95%; High: 10%/90%. Measures used for matching neighbourhoods. Group A Measures: Average household income, % households with income ¿$100,000, % of households identified as below the low income cutoff, Average dwelling value; Group B Measures: Those in Group A plus % of the population whose home language is French, % of population whose ethnic origin is identified as Haiti; Standard error calculations: Panel A Columns (1) & (3): bootstrapped standard errors and Panel A Columns (2), (4), (5) and Panel B (all columns): inverse propensity weights with regression adjustment. 2007-2010 Haiti period compares changes from 2007/2008 returns with 2009/2010 period; period around the December 2004 Tsunami is 2002/03 as the control years and 2004/05 the treatment years; period when no major natural disaster is 1997/98 as control period and 1999/2000 as treatment period.

Table 3.6: Special Charity Appeals by the Canadian Red Cross to Illustrate Disasters and Events of Interest to Canadians

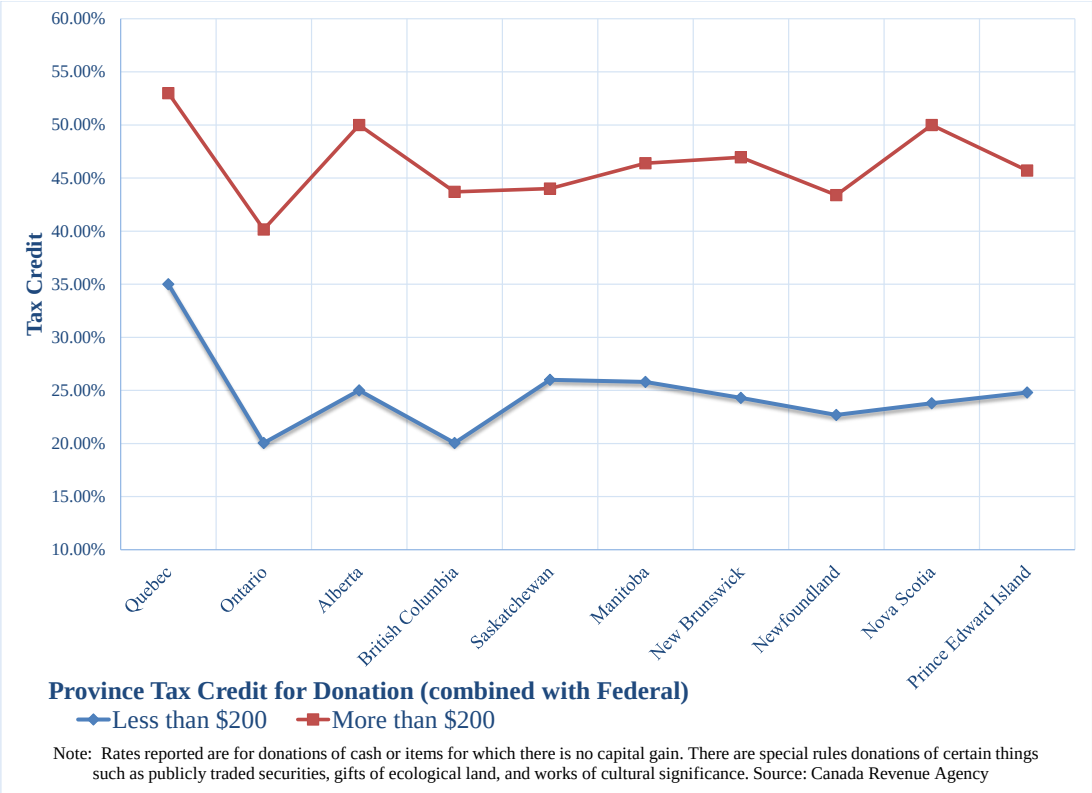
2010	
Canada: New Brunswick Flood	Severe flooding in southwest New Brunswick and Fredericton forcing 100 evacuees from homes. General appeal
Canada: Gaspesie Floods	Heavy rains in December affecting hundreds of people. General appeal
Canada: Hurricane Igor	Eastern Newfoundland and Labrador on September 21; washed out roads, power outages. General appeal
Canada: WesternCanada Severe Weather	British Colombia issues with melting snow, flooding; general appeal
Red Cross response in Haiti	7.0 earthqualke affecting 3 million people and leaving 200,000 homeless
Pakistan Floods	Flooding destroying 1.7 million homes, damaging 5.4 million acres of farmland and affecting 20 million people
China Floods	Flooding July to August causing a massive mudslide destroying homes of 45,000 people
Chile Earthquake	8.8 magnitude killing 700 and affecting 2 million people. International appeal for $7 million
China (Qinghai) earthquake	Qinghai province killing 617 and injuring 10,000, toppled 15,000 residential buildings
Philippines Typhoon	Typhoon Ketsana killing 240 and affecting 1.8 million
Hurricane Season 2010	Hurricane Tomas affecting 1,900 homes located on Caribbean islands plus general appeal
2009	
Canada: WesternCanada Severe Weather	Summer floods, forest fires and tornadoes. General appeal
Canada: Ontario Tornado Appeal	Tornadoes in Vaughan, Ontario on August 20th; 100 residents evacuated from homes
Canada: BC Fires	10,000 people evacuated due to forest fires in British Columbia
Canada: Manitoba Floods	Flooding considered second worst (first worst in 1997)
Hurricane Season 2009	General appeal to support hurricanes in the Caribbean
Pakistan Conflict	Hostilities resulting in 2 million fleeing their homes, need for humanitarian aid
Earthquake in Italy	6.3 earthquake in L'Aquila killing 290, injuring 1,500 and leaving 28,000 homeless
Gaza Crisis	Hostilities killing 1,300 Palestinians, induring 5,500 and destroying or damaging 20,000 houses
Zimbabwe Cholera Crisis	Cholera epidemic resulting in 3,700 deaths and 78,000 illnesses
Democratic Republic of the Congo	Hostilities between the country and its neighbors and natural disasters
Food Security Crisis Appeal	International appeal driven by rising food prices
Americas Floods	Heavy rains in Central and South America displacing 200,000 people
Colombia Floods	Extensive flooding affecting 31,000 people, damaging 100 schools and 1,400 houses, in particular in Narino
2008	
Canada: New Brunswick floods	Appeal tied to flooding along the St. John River in New Brunswick
USA Disaster Relief	Many events including tornadoes, wildfires, floods, hurricanes
Pakistan earthquake	Series of earthquakes killing 160 and displacing 17,000 people
Hurricanes	Haiti (affecting 54,000 homes and 131,000 families), Caribbean (Cuba (destroying 63,000 homes plus farms, schools, etc), Jamaica/Bahamas/+ Islands)
Earthquake in China	7.9 earthquake in Sichuan (south-west province) killing 80,000; injuring 374,000 and leaving 15 million homeless
Asia Typhoon	Several events affecting 235 million people
Myanmar: Cyclone Nargis	Cyclone killing 85,000 people and 2.4 million affected

Crisis in Sudan	Darfur, Nazradeen crises affecting delivery of humanitarian aid. International appeal of $30.6 million for Darfur
Georgia/Russia Conflict	Conflict across Georgian, South Ossetian and Russia devastating homes, international appeal of $8 million
Ukraine Floods	Western Ukraine worst floods in 200 years damaging 40,000 homes, farm land, and roads
Eastern Africa Cyclone	Devestating cyclones hitting mostly Madagscar and Mozambique displacing 300,000 and affecting farm land
Chadian Refugee Crisis	Intense fighting between rebel and government forces at least 30,000 refuges went to Cameroon
China Snow Disaster	Unusual cold and heavy snow affecting 19 provinces forcing 1.76 million from their homes, toppling 223,000 houses, and damaging 862,000 homes generating $8.2 billion in economic losses
Southern Africa Floods	Affecting 6 countries most notably Mozambique (55,000 evacuated from homes)
Kenya Crisis	On-going violence affecting 100,000 people (120 killed)
2007	
Canada: Western Canada Floods & Severe Weather	General appeal tied to extreme weather conditions
Asia Floods	Major flooding in Bangladesh (Cyclone Sidr + monsoons; destroyed 500,000 homes, killed 3,000 affected 6 million people), Nepal (impacting 333,000), India (impacting 14 million people), and Pakistan (affecting 2.5 million people); international appeal $18 million)
Hurricanes	International appeal for $1.4 million for people affected by Hurricane Dean (Caribbean)
Africa Floods	Extensive flooding affecting 1+ million people in 18 countries in East, Central, and West Africa. Canadian Red Cross sent $100,000.
Peru Earthquake	7.0 Earthquake killed hundreds and left 700,000 people homeless. International appeal for $4.8 million
China Floods	International appeal for $8.2 million due to flooding that affected 200 million people and leaving 5 million displaced and 500 dead
Mexico Floods	Floods affected 1 million people in Tabasco; International appeal of $973,000; Canadian government gave $100,000 in assistance
Floods in Sudan	Nile river flooded many state in the Sudan, displacing 300,000 people, destroying 60,000 homes. International appeal $4.8 million
Fires in Greece	Forest fires in Greece affecting villages, agriculture
USA Tornado	Tornado in Kansas on May 4th; destroyed homes and business; 9 people confirmed dead
Southern Africa Floods	Widespread flooding in Mozambique; 140,000 people displaced and living in temporary shelters
2006	
Middle East Crisis	Conflicts resulting in evacuations from Lebanon, assistance in Palestine and other countries
Asia Typhoon Relief	Typhoon Durian affecting 650,000 people (1,050 dead) in the Philippines and Vietnam
Indonesia Earthquake	Earthquake on May 27th of 6.2 in city of Yogyakarta; 6,000 people dead and over 50,000 with injuries; 174,000 houses damaged/destroyed.
Phillipine Landslide	Massive landslides on February 17th in village of Guinsaugon; confirmed dead 154; affecting 281 houses (8,000 persons)
2005	
South Asia Earthquake (Pakistan)	October 8, 2005, killed 73,000 and made 3.5+ million homeless

Southern Africa Food Crisis	Serious drought affecting 10 million people (on brink of starvation)
Hurricane Stan	Affecting Central America (October). Death tol highest in Guatemala (650 people)
Hurricanes Rita and Katrina	Affecting southern US
Guyana Floods	Torrential rainfalls in December affecting more than 150,000 people (shelter, clean water)
2004	
Sudan Crisis	Darfur region, violence and terror affecting 1 million people (moved from homes)
Asia Earthquake and Tsunami	December 26, 2004 (and subsequent earthquake in March 2005)
Hurricane Ivan	Cayman Islands, Cuba, the Dominican Republic and Haiti; Haiti also affected by Tropical Storm Jeanne causing flooding
South Asia Floods	Floods in Bangladesh and Nepal that killed 900 and affected 50 million people.
Hurricane Charley	Affecting Florida, destroyed over 15,000 homes, killed 13 people
Dominican Republic / Haiti Floods	900 died as result of heavy rains, flooding and mudslides, Spring 2004
Earthquake in Morocco	February 24th damages to several villages with hundreds of people that died

Source: http://www.redcross.ca/donate/your-donation-in-action/past-appeals

Figure 3.1: Comparison of Tax Credits For Giving for Tax Year 2010



Note: Rates reported are for donations of cash or items for which there is no capital gain. There are special rules donations of certain things such as publicly traded securities, gifts of ecological land, and works of cultural significance. Source: Canada Revenue Agency

Figure 3.2: Neighbourhoods in Quebec by Percent French

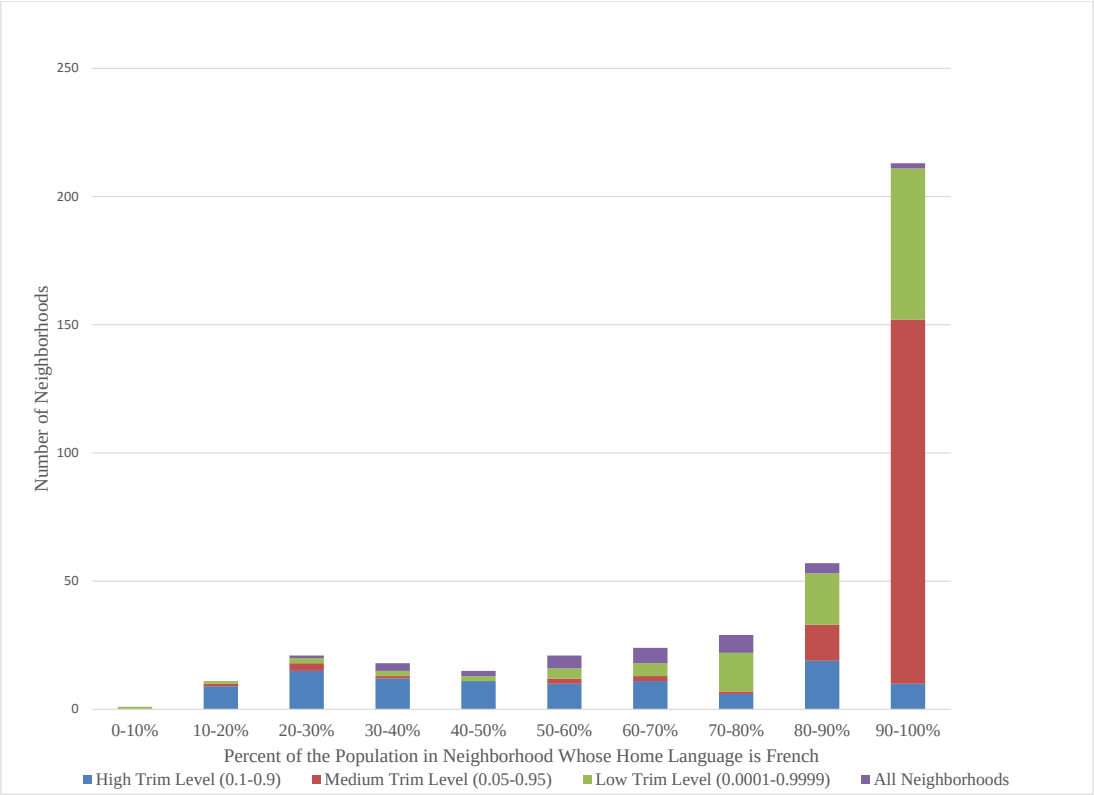
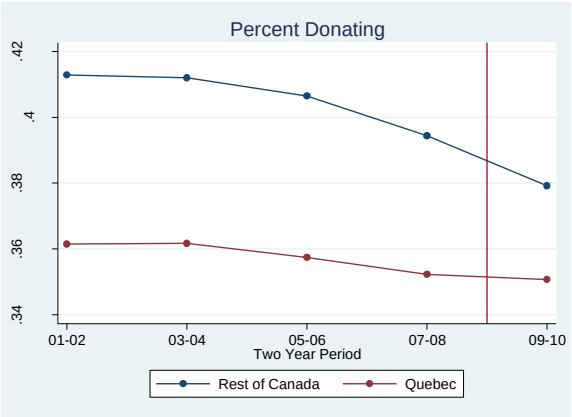
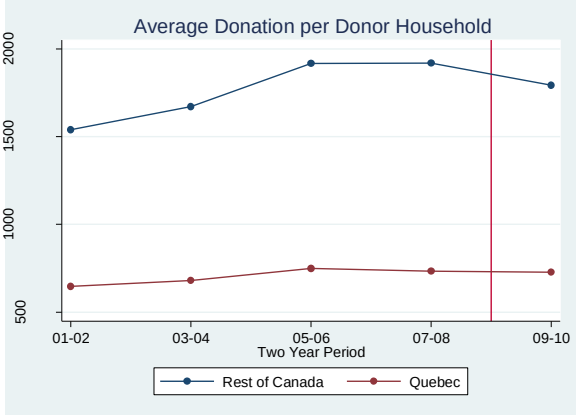


Figure 3.3: Donation Trends 2001 2010





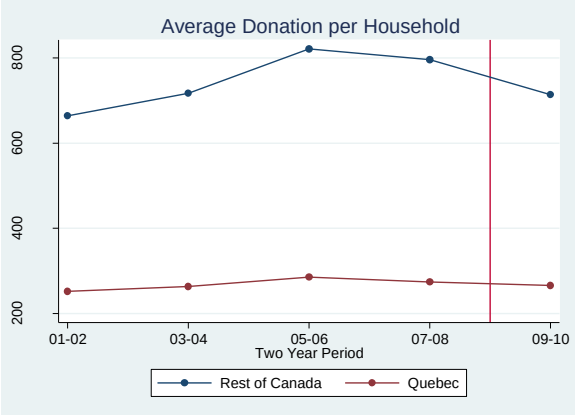
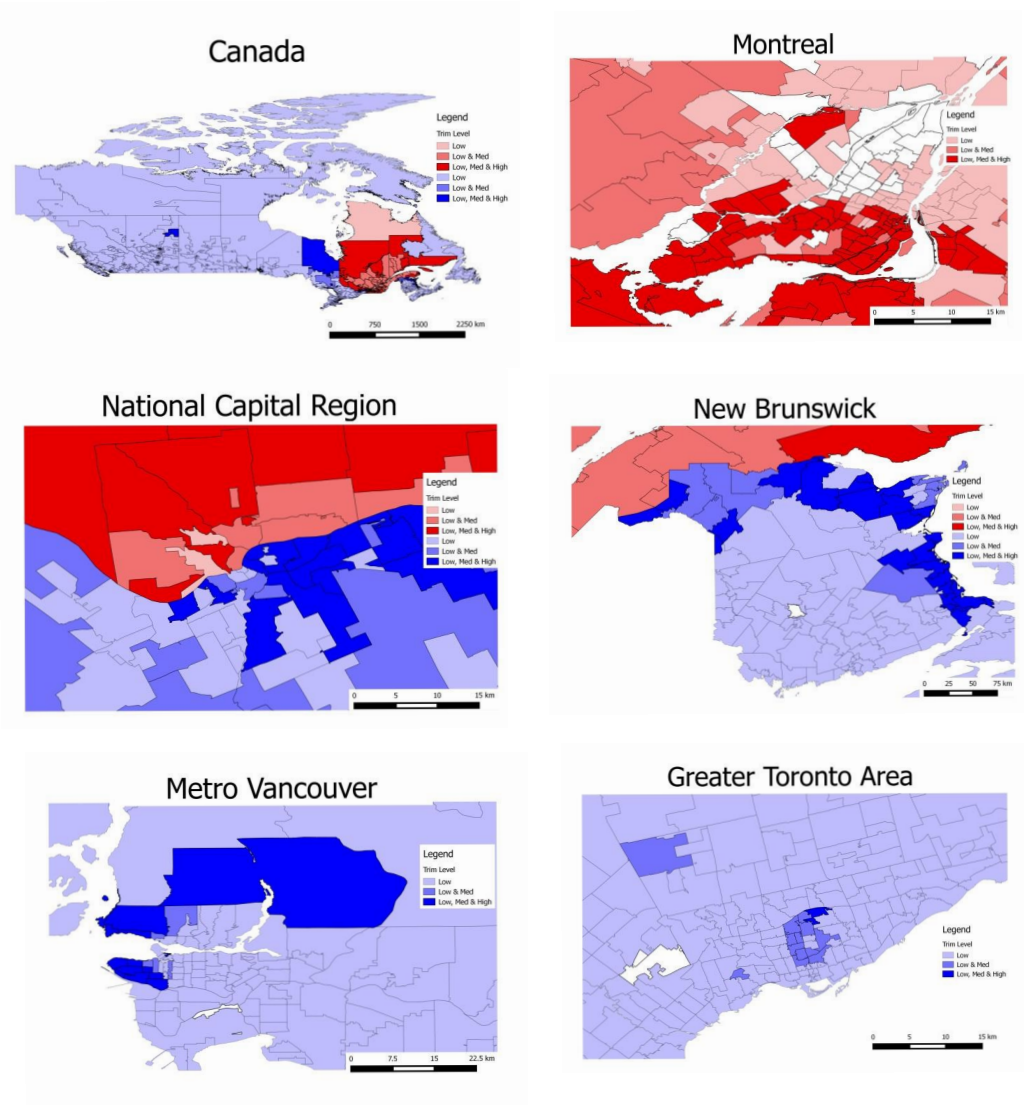


Figure 3.4: Maps of Matched FSAs with Panel A & B Measures



Conclusion

In this thesis I present three essays which explore the relationship between three sides of the market for charitable giving - the charities that acquire and use funds to provide goods and services, the donors who make donations to charities and receive incentives from the government for providing these donations, and the government who provides direct grants to charities and provides incentives to donors for giving to charities.

In the first essay we explore the interaction between the government and charities. We use a grant program from a province in Canada to add to the understanding of how charities respond to government grants. We find that the grants increase current revenues by about 17% suggesting the grant has a positive impact on current revenues and is not crowded-out by other sources of revenue. We also find that the effect of the grant persists over several years. The estimated effect of the grant varies by the size of the charity, with the effect being largest for small charities (27%), slightly smaller for medium sized charities (18%) and close to zero for larger charities. We then use the dollar value of the grant and find that the grant slightly crowds-out other sources of revenue for small charities, slightly crowds-in other sources of revenue for medium charities and has a strong crowd-in effect for larger charities. We compare to previous work with a similar grant program in the UK and find very similar results. The main contribution of this work is to provide evidence that charities behave in a similar

manner to government grants across different funding programs and countries.

In my second essay I study how charity managers influence a charity's finances. Using a multi-leveled fixed effects model I find that the manager has a significant impact over all financial outcomes. I find that married couples are shown to be of higher quality managers when using total revenue and government revenue as the outcome of interest, while individuals are shown to be higher quality managers for private donations. When comparing the male and female managers, the female managers are shown to be of higher quality for all outcomes.

Extending the baseline model to allow match effects between managers and charities using two different approaches, I find strong positive match effects between charities and managers, particularly for total revenue. These results suggest that the interaction between a manager and a charity is important to take into account when measuring the quality of managers. A second extension allows for the effect of the manager to persist beyond the tenure of a manager at a charity. My contribution from this chapter comes in two ways. First, I construct a novel dataset that matches charity managers with a charity's finances to present the first causal evidence of the effect of charity managers. Secondly, I extend the standard model used to study leadership to allow for persistence in the effect of the manager. This persistence is particularly important to take into account when studying leadership in settings where the leader sets policies or takes actions that can have lasting consequences.

In the third essay, we explore the relationship between the government and donors. We contribute to the literature on incentives for charitable giving by exploring the relationship between the timing and salience of tax incentives and donation decisions. We use a natural experiment brought on by the Haiti Earthquake in 2010 that led the Quebec government to allow their residents to claim donations made to Haiti relief efforts on their previous year's tax return. We match neighbourhoods in Quebec with

neighbourhoods located outside of Quebec using measures that reflect income, house value, ethnicity, and the language spoken at home. We find that giving increased both on an extensive and intensive margin. On average, the percentage change in the share of households reporting donations increased by 2 percentage points and the percentage change in the donations per donating household increased by 7-9 percentage points. This resulted in an observed increase in the percentage change in donations per household of 11 percentage points.