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Governance and Canada's Exports: Does Firm Size Play a Role?

An investigation into the effects of governance on the exporting patterns of Canadian SMEs versus Large firms

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"Only those who risk going too far can possibly find out how far they can go."
T.S. Elliot

I. Introduction

Exporting is challenging and thus generally rare amongst firms. Exporters face numerous barriers, but they are motivated to enter foreign markets with the promise of economic benefits through increased competitiveness and productivity. In an era of globalization and free trade, policy makers are particularly concerned with the difficulty that exporters experience in entering foreign markets. While there are a multitude of factors that affect exporters, the focus of this study is the impact of governance on the exports of Canadian firms grouped by enterprise size.[1] The goal of this paper is to establish if and how enterprise size impacts the capacity of Canadian firms to export, with a view towards helping policy makers develop more effective solutions to assist Canadian firms in their international exporting endeavours.[2]

An attempt is made to elucidate whether there is a difference in the exporting patterns of Canadian firms across enterprise size. It is rather natural to argue that smaller firms characteristically behave differently than larger ones, but without evidence it is difficult to say how the differences manifest themselves with regards to exporting patterns. In studies exploring the characteristics of firms and the economics associated with them, firm size is often mentioned as a key factor impacting a firm's activities. Nonetheless, the role of size on the exporting patterns of firms is still not fully understood. Furthermore, while the exporting patterns of Canadian exporters have been studied, the relationship between the governance

[1] In this paper governance is characterized by the six World Governance Indicators (WGIs), which are described in more detail in subsequent sections.
[2] For the purposes of this paper, the terms firm and enterprise will be used interchangeably.

environment of the foreign markets and the size of Canadian firm has not been explored (Sui and Yu 2012).

This paper attempts to illustrate specific governance characteristics of foreign markets that impact exports, while controlling for firm size. As the characteristics of the foreign markets are complex and varied, it is important that they be well defined. The most comprehensive indicators of governance today are the World Governance Indicators (WGIs). To take account of the complexities of governance, the there are six WGIs representing the different aspects of governance: voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption. Accordingly they are used to proxy for the governance of foreign markets in the model employed in this study.

Trade has commonly been modeled by the gravity model, which in its most elementary iteration has distance as a proxy for trade barriers. While many proxies for factors affecting trade have been tested, the impact of governance has not been explored in great detail. In a recent review of empirical studies dating from 1999-2009, only one included an indicator relating to governance (Kepaptsoglou, Karlaftis and Tsamboulas 2010). Here, using the same model, the effect of governance will be explored in more depth.

While the effects of international trade have been well studied by economists at the aggregate level, it is only more recently that studies have investigated the effects of international trade in increasing detail. The scarcity of firm level data hindered the progression of investigations in

international trade beyond aggregate levels until the beginning of the 2000's, when an increasing number of firm level data sets became more readily available. Today there is a push amongst researchers to understand the relationship between firm characteristics and international trade. Accordingly, this study relies on a dataset that includes some details on firm level characteristics of Canadian exporters in order to explore how international trade interacts with the Canadian economy at a more detailed level.

In order to explore all the likely interactive relationships between the governance indicators and the size characteristic of firms three models are employed in this study: level estimates, semi-interactive estimates, and fully interactive estimates. The regression methodologies include the common ordinarily least squares (OLS) as well as pseudo poisson maximum likelihood (PPML) and feasible generalized least squares (FGLS) as robustness checks. The theoretical reasons for employing these methodologies are explored in the third section of this work.

While the results of the study do not point to important differences between the way governance environments affect the export patterns of small and medium size enterprises (SMEs) and large firms, the tests suggest that the way firms export do vary across size according to the gravity control variables. In particular, "control of corruption" significantly affects larger firms to a greater extent than SMEs using the OLS method. The most noteworthy finding is that large firms tend to react more in general to the gravity controls, variables in the model not characterizing governance, in general than the SMEs do. This suggests that the exporting

patterns of large firms are less diverse than that of SMEs, which is supported by the level OLS estimates that show that SMEs are more likely to exports to a larger variety of destinations. Nonetheless, it is clear the results do suggest that the governance indicators have a significant effect on exports in general. Further, when the model is decomposed into its margins according to the method used by Lawless (2010) all the governance indicators have a significant effect on the extensive margin as well as intensive.

The paper begins with a literature review, which touches briefly on the three main factors interacting in the empirical model under investigation: firms, firm size and governance. Subsequently, there is a section that reviews the gravity model. The fourth section describes the methodology employed in the empirical analysis. Results are examined in the following section. Finally, the last section concludes. Two appendices are included at the end of the paper: one that tests the individual strength of the relationship between each governance indicator and exports; and the other tests the effect of a smaller contingent of governance indicators thought to have a greater impact on business on exports. Neither of these experiments had very interesting results, and thus was not included in the bulk of the analysis.

II. Literature Review

Firms in International Trade

The benefits from international trade due to comparative advantage, consumers' love of variety, and increasing returns to scale; but until more recently little consideration had been given to the role of firms in international trade. Bernard and Jensen (1995) were among the first to

explore the characteristics of exporters and how this affected their movements abroad. Studies have shown that productivity is a key determinant of exporting firms versus non-exporting firms (Baldwin and Gu 2003). Exporters have been identified as being "larger, more productive, more skill- and capital-intensive and to pay higher wages than non-trading firms" (Bernard et al 2007). With this in mind, it is easy to see why policy makers have an interest in understanding how to assist firms in their exporting initiatives. As policy measures encourage exports through reduced trade barriers and transportation costs declines, enterprises with higher productivity levels develop while other, less productive ones, fail, leading to welfare gains as resources are allocated to more efficient activities.

There have been substantial changes in the literature regarding trade theory over time. Prior to the 1980's, there was a general belief that countries traded solely according to their comparative advantage. When the source of the comparative advantage is classified as "Ricardian" (Ricardo 1817) or "Heckscher-Ohlin" (Ohlin 1933), i.e., stemming from productivity differences or factor intensity/endowment differences respectively, both "traditional" trade theories focus on the differences between countries. Alternatively, newer trade theories explore the fact that much of trade occurs between similar countries. These studies move beyond inter-industry trade – i.e., trade that occurs between countries specializing in certain industries to trade with others specializing in complementary industries – in order to examine trade that occurs within industries, referred to as intra-industry trade.

The “new” trade models developed by Krugman (1980), Helpman (1981), and Ethier (1982) emphasized a blend of consumers’ love of variety and firms’ economies of scale. “New” trade theory allows for similar firms to dedicate themselves to particular versions of the same product, and trade them internationally by way of intra-industry trade. Helpman and Krugman (1985) combined the traditional theories and “new” trade theory. In their pivotal piece of work, they combined increasing returns to scale with intra-industry product variation in a model featuring endowment-type comparative advantage. However, all the models to this point assumed a representative firm within each industry.

The theoretical underpinnings of heterogeneous firms in international trade are part of the development of “new, new” trade theory. Exploration into this line of research began with the work of Melitz (2003). Melitz developed a model that showed that only the most productive firms have the capacity to overcome the inherent fixed costs associated with exporting. This model implies that there is a theoretical productivity threshold that a firm must surpass before it is able to export its wares to international markets. The model concurrently suggests that less productive firms would only have the capacity to serve the national market. Melitz showcased, theoretically, a new source of welfare gains that had only previously been documented empirically. Specifically, he notes:

> “…how further increases in the industry’s exposure to trade (driven either by trade liberalization or the addition of new trading partners) lead to additional inter-firm reallocations towards more productive firms [...] shows how trade can contribute to the

> Darwinian evolution of industries – forcing the least efficient firms to contract or exit while promoting the growth and success of the more efficient ones."

The model solidified the notion that exporters have inherently different characteristics than non-exporters. Further, it demonstrated that aggregate productivity is influenced by firms' propensity towards being more productive and their exports.

For the policy-maker, this raises the question of what characterizes a "more" or "less" productive firm. Thus researchers continue to explore the determinants and characteristics of exporters in order to identify them by features such as size, age, or management structure. With the ability to tailor policies based on this information, policy makers could support firms' development into more productive and competitive international players. This paper's focus is on the most easily identifiable firm feature – size – and its relation with export patterns.

Effects of Size

Research into the effects of firm size on export performance has had mixed results. While firm size is generally considered a determinant of export performance, studies have not been able to conclusively argue that larger firms are characterized differently from SMEs when it comes to exporting.

The claim of the positive relationship between firm size and improved export performance stems from the suggestion that larger firms have more resources available to them, which

allows them to exploit economies of scale to enhance their performance. Improvement in performance is subsequently associated with the activity of exporting. An empirical literature review of 50 cross-sectional studies (case studies were excluded) at the end of the 90's concluded that "it remains largely unclear whether the determinants of export performance are different between large firms and small or medium-sized firms" (Zho and Stan 1998). Country studies have been just as confounded by the data. For example, a study of Thai exporters showed that larger exporting firms did not necessarily perform better at exporting (Archarungroj and Hoshino 1998). Likewise, an Australian study indicated that no clear linkages could be deciphered between size and exporting (Commission 2003).

Currently, it is apparent that policy makers are focused on small and medium size firms. Reasons for this may lie in the fact that a large majority of firms in most countries are of the small and medium size variety or that governments feel that these are the players that require the most assistance. Notably, in Canada, SMEs made up a larger share of business-sector GDP than large firms in 2005 – SMEs made up 54.3% of business sector GDP compared to 45.7% made up by large firms (Leung, Rispoli and Gibson 2011). Indeed, governments world-wide categorize small and medium size firms as the "engine of growth" (German Federal Ministry of Economics and Technology (2012), Trinidad and Tobago Chamber of Industry and Commerce (2012), and Orser and et al (2013)).

Support for SME exports is so prevalent that there have been studies of the impact of export promotion programs on different size firms. Interestingly, although it is unclear as to whether

larger firms are more successful exporters, evidence suggests that the impact of export promotion programs is indeed greater for firms of a smaller size (Marincus and et al 2010). This paper will attempt to address this lack of confidence in the relationship between exporting and firm size by taking advantage of a Canadian database – the Canadian Importer-Exporter Registry.

Impact of Governance

Trade has become increasingly prevalent due to a number of factors. According to Feenstra (1998), the expansion of trade is due to the combination of trade liberalization, falling transportation costs, the increasing economic convergence of countries, and heightened exchange of intermediate goods. Similarly, Baier and Bergstrand (2001) explored factors that affect trade growth and found that income growth, lower transportation costs, and reduction of tariff rates have all contributed to the trade growth trend. There are, however, other factors that impact trade flows. Of particular interest for policy makers is the influence of governance, due to their responsibility to shape and form it.

It is often difficult to separate the different facets of governance needed to understand their direct effect on international trade. In order to have a more complete view of governance in this study, the World Bank Governance Indicators (WGI) are utilized as a proxy for the different characteristics of governance (Kaufmann, Kraay and Mastruzzi 2009). Many researchers consider the WGIs the “best existing measures of the quality of political institutions” (Kurtz and Shrank 2007). The indicators were developed with the support of the World Bank, and combine a large number of measures of governance and democracy into six distinct groupings. The WGI

are noteworthy for two important reasons: the indicators are aggregated over various sources, significantly reducing measurement error, and they are constructed on an annual basis over a large number of countries. The annual construction of the WGI began in 2002. Prior to that year, the indicators were available for 1996, 1998, and 2000. Currently, the WGI covers over 200 countries and the sources used to construct the indicators number 31 from 25 different organizations. Originally developed using an unobserved components model to lie between -2.5 and 2.5 with a standard deviation of 1 and a mean of zero, the WGI's used in the analysis have been normalized between 0 and 100 for ease of interpretation. As with the original index, a higher unit value indicates better governance. In most instances Canada, for example would lie closer to the 100 unit mark while Somalia to the 0 unit mark.

The six indicators are described as following in Kaufmann, Kraay, and Mastruzzi (2007):

1 – Voice and Accountability (VA): a variable measuring the perception of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and free media.

2 - Political Stability and Absence of Violence (PV): a variable measuring the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

3 – Government Effectiveness (GE): a variable measuring the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

4 – Regulatory Quality (RQ): a variable measuring the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

5 – Rule of Law (RL): a variable measuring the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

6 – Control of Corruption (CC): a variable measuring the perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Governance, as defined for the purposes for this paper, is a comprehensive term taking on all aspects of the WGIs. But there is one element of governance that has been the focus of the bulk of the research regarding governance and international trade. Specifically, the relationship between democratic institutions and international trade has been much explored, but the

results have been mixed. Democratic institutions can foster opposite effects on trade, as they affect both "pluralism", which can have a negative effect, and "property rights protection", which may have a positive effect (Li and Resnick 2003). Beginning in the 1980's, there was a rising impetus by developing and emerging markets to shift their views outwards towards more export oriented trade regimes. These changes often came in parallel with political and social regime changes:

"Historically sharp changes in trade policy have almost always been preceded (or accompanied) by changes in the political regime. Not all political transformations result in trade reform, but sharp changes in trade policy are typically the result of such transformations" (Rodrik 1994).

While the question that liberalization was one of the main movements of the late 20th century is indisputable, the association between liberalized trade regimes and democracy have yet to be disentangled. The complexity behind the political economy of the trade-democracy relationship is not the sole focus here and thus cannot be justly explored, but it is important to note that it has a part to play in the model under review. Indeed this aspect is an important element of two of the governance indicators used in the empirical part of this study. Milner and Mukherjee (2009) wrote a recent comprehensive literature review of the relationship between democracy and trade, and note that increased democracy tends to increase the trade openness of countries significantly. Surveys of workers suggest, however, that lower skilled workers have a tendency to oppose trade openness. Thus workers are more inclined to be against trade liberalization when asked for their voice in a democratic setting – counter to the broader trend

that democracy tends to foster trade openness (Milner and Mukherjee 2009). Democracy characterizes only one aspect of governance, in the broad sense, and the broader definition of governance has not yet been the subject of many investigations.

The present study, taking both firms and their size into account, aims to look at the broader picture of how exporters respond to the variety of governance regimes they encounter on their ventures abroad. Of particular interest is how the various aspects of governance affect exporters entering new markets. The empirical focus is on the relationship between governance and the exporting patterns of Canadian traders of varying firm size, with a view towards shaping policy to assist Canadian firms in their endeavours abroad.

Governance, being so broad in scope, can be both positively and negatively related to trade according to how it is defined and measured. According to the definitions used here, two variables could possibly have a negative or unimportant correlation with trade: voice and accountability, as well as political stability. Voice and accountability captures the extent of democracy and pluralism in the country and, as a result, lower skilled workers have the opportunity to voice their opposition to foreign competition. With regards to political stability and absence of violence, trade should not be significantly affected and the risk of any negative effect is low as sales are made from international to domestic markets in contrast to foreign direct investment that is hosted in the foreign environment and would be more susceptible to being positively affected by political stability and the absence of violence.

On the other hand, trade should have a positive relationship with the four remaining governance indicators: governance effectiveness, regulatory quality, rule of law, and control of corruption. This is supported by the requirement that trade flourishes in an environment in which business is easily conducted. If the quality of the public service is reliable, regulations are supportive of private sector development, individuals are confident in the rule of law, and corruption is not rampant, one would expect that trade and business would be more easily conducted. There are questions related to the ambiguous effect of corruption on business. Some speculate that, up to a certain threshold, corruption may act as a lubricant to business in the face of market failure (Acemoglu and Verdier 2000). Such issues, though, are beyond the scope of the analysis here.

While the three trade-related factors (firms, firm size and governance) have been explored separately, as discussed in this literature review, their relationship has yet to be tested simultaneously. Using the gravity model, this study will attempt to identify how exports, firm size, and governance interrelate.

III. Gravity Model Overview

In order to better place the work undertaken in this paper, this section provides a brief overview of the gravity model's lineage and development over the past half century. The section is intended to shed light on the relevance and prolonged prominence of the gravity model in international trade empirics.

History

Stemming from the physical sciences, the gravity equation is analogous to the Newtonian theory of gravitation – hence its name. Just as the force of attraction between two masses is relative to their sizes and proximity to each other, this model suggests that trade between two nations is proportional to their gross domestic products (GDP) and inversely proportional to the distance between them. Jan Tinbergen first identified this relationship in 1962. Mathematically this identity can be represented as follows:

$\frac{\quad}{\quad}$	Equation 1

The equation has stood the test of time, and is considered to represent one of the most stable and robust empirical economic relationships. Empirical evidence for the stability of the gravity relationship between economic size and distance between partners has proven remarkably stable across time, countries, and methodologies. The catch lies in the theoretical foundations of the equation.

Until the later work of Anderson in 1979, there were few credible attempts to tie the gravity equation to formal economic theory of international trade. At the time the predominant models of international trade included the Ricardian model and that of Heckischer-Ohlin (H-O). Even so, Anderson's work was based on the Armington assumption, rather than either of the traditional theories. The Armington model posits that the country of origin differentiates goods,

while in parallel consumers have defined preferences for these goods. Consequently, a country would consume at least some of each commodity from every other nation. Regarding trade costs, Anderson used the "iceberg" model. This model assumes that only a portion of shipped goods arrive at their intended destination, as some are always lost in transit.

Since the time of Anderson, there have been a variety of attempts to give the gravity model a theoretical basis. Indeed, contemporary work has been able to address the objectionable feature of the Armington assumption that goods are distinguished by their production location; as well, in the last decade or so, foundations in the traditional models of trade have been uncovered for the gravity model of trade. Work on the gravity model can be ascribed to a number of prominent papers written by Bergstrand, Deardorff, Eaton and Kortum, Helpman, and Chaney. Bergstrand (1989) built off the model of monopolistic competition developed by Paul Krugman (1980) to show that the gravity model of trade is a direct consequence of the theory. In the late nineties, Deardorff (1998) was able to show that the gravity model could be linked to the traditional H-O model or factor endowment model. Finally, in the early 2000s, Eaton and Kortum (2002) were able to tie the gravity model to the standard Ricardian theory of international trade.

More recently, the gravity model's implications on firm level data have been explored. Using an international trade model based on firm heterogeneity and differentiated merchandise, Helpman et al. (2008) and Chaney (2008) have tied this new trend to the gravity model. Some of the most recent work integrating theoretical ideas relating the heterogeneity of firms to the

gravity model is very pertinent to the questions raised here. In some cases, the analysis benefits from the decomposition of the gravity model as exemplified by Lawless (2010), as the method allows for the firm element of the data to be examined in more detail. The model, based on assumptions of heterogeneity across firms due to productivity and fixed costs differences, suggests that there is a threshold that productivity must exceed if a firm is to export to any given country (Melitz 2003). Lawless (2010) identifies how the Melitz model can be used to show how the different gravity model factors would affect the margins of a decomposed gravity model, i.e., the extensive (number of enterprises) and intensive (average value of exports per enterprise) margins.

Overview of Current Methods

Theoretical Methods

Currently, building on the theoretical foundations of the gravity model, researchers are investigating how the gravity model may be utilized to analyze firm level trade data. The interest in the heterogeneous nature of firms has prompted investigations into how the gravity model can be configured in order to incorporate the characteristics of individual firms while retaining the stable features of the traditional trade model. Interest in the gravity model has not abated despite the weaknesses described above.

As part of the empirical analysis, the gravity model will be decomposed according to the Melitz model as exemplified in Lawless (2010). Once decomposed, the gravity model is characterised by the following equation:

	Equation 2

Where is defined as Canadian exports to country j.

In its decomposed form the gravity model's dependent variable becomes the sum of the extensive (no. of enterprises) and the intensive (average exports per enterprise) margins. The decomposition method is a convenient way to conduct some firm level analysis without having to collect micro data at the firm level. Analysis is further aided by the fact that total trade is so easily related to the firm level analysis. Lawless (2010) goes on to argue that the gravity model variables should have most of their impact on the extensive margin. GDP should have a positive effect, while factors affecting fixed and variable trade costs should affect the extensive margin negatively. She shows that the effects on the intensive margin are more ambiguous as factors that reduce fixed cost bring in more competition, while factors that reduce variable costs improve average sales.

Empirical Methods

As the theoretical underpinnings of the model have developed, there have been some major progressions in the gravity model's estimation methods. The empirical robustness of the gravity model is a very unique and tempting feature. Consequently, there has been a propensity to use the empirical model, either without much question or with disregard of the theoretical complexity of the model. A more recent wave of work has attempted to bridge the theoretical and empirical divide by analyzing the biases that occur without taking the more recent

theoretical work into account. The types of errors vary in acuteness, but major faults in empirical estimation have been found to stem from failing to include a multilateral resistance term (MRT), which is described below, as well as failing to address the incidence of zero-trade data.

These issues prompted Baldwin and Taglioni (2006) to address three major errors they felt were occurring when traditional methods of utilizing the gravity model were employed. They call these blunders the gold medal, silver medal, and bronze medal mistakes – the type of medal identifying the severity of the mistake. Following are the three major errors Baldwin and Taglioni identify as being the most common and severe mistakes made in estimating the gravity equation.

"The Gold Medal Mistake"

Accordingly, the most prominent and egregious error is to omit the so-called "remoteness" factor as coined by Baier and Bergstrand (2007). Upon initial development by Anderson and van Wincoop (2003), the factor was identified as the MRT (multilateral resistance term). The term addresses relative trade costs, which are now understood to be part of any well-specified gravity model, by incorporating the propensity of one country to trade with a partner taking its other trade relationships into account. For example, ceteris paribus, the trade between two small countries, such as Laos and Cambodia, would be of a smaller value in the presence of some larger economies, such as Thailand and Vietnam, than if the two economies were islands next to each other in the middle of the Pacific Ocean. The MRT is small if the country is relatively removed from world markets, which can be due to geographical factors or policy

factors imposed by trade costs in the form of tariff barriers and the like. According to Anderson and van Wincoop (2003), in a world with N countries and goods differentiated by country the correctly specified gravity model would take the following form:

	Equation 3

Where:

= exports from i to j (or total trade between the two countries)

= world GDP;

GDP_i and GDP_j = GDP of the origin and destination countries respectively;

t_{ij} = 1 + tariff equivalent of trade costs (the cost of importing from "i" in country "j");

$\sigma > 1$ (the elasticity of substitution)

π_i and P_i = origin (exporter) and destination (importer) multilateral resistance terms

More recently, there have been suggestions that a first order Taylor series expansion can be used to estimate a linear approximation of the MRT in order to avoid the non-linear method suggested by Anderson and van Wincoop (2003). In this estimation, the proxies for trade costs are distance and common border effect.

Empirically, in order to control for the MRT, it is common to use a time series data set and utilize fixed effects to estimate both the importer and exporter resistance terms. Such an exercise is equivalent to creating dummy variables for each importer and exporter for every

year. The number of potential dummies is 2nT. In the case of a single cross-section, the MRT may only be estimated by way of pair-wise characteristics such as common colonial masters, currency, or language. Often, remoteness is used as a proxy for MRT. As remoteness is readily calculated, and does not require time series data as the fixed effects method does, it offers an option to proxy MRT in cross-section type data sets. Remoteness is frequently estimated in the following form:

	Equation 4

The issues with this proxy is that the only trade barrier that is accounted for in the formula is distance (Baier and Bergstrand 2009).

Further, in that dummies can serve as proxies for fixed effects, a dummy for each importer and exporter nation are often to mimic fixed effects. Unfortunately, dummies for exporter and importer nations are not feasible in the analysis underhand. Only two years of data are available, and Canadian exports to the world alone are included. At a maximum, just 511 observations can be included in the regression if both years are pooled, and about half of that number if only one cross-section is used. By including 2nT dummies we would have more coefficients than observations. Further, due to the fact that the World Governance Indicators (WGIs) are country specific and time varying, country and time varying fixed effects cannot be utilized, as perfect collinearity would occur. In this study in order to address the “gold medal”

mistake, the “remoteness” variable of equation 3 is estimated and included in the regressions as a proxy for the MRT.

“The Silver Medal Mistake”:

This mistake is made when average reciprocal trade flows are used in place of separately treating exports and imports. Although this type of error may not be large in the case of relatively balanced trade, if bilateral trade is on the unbalanced side the results can be biased. In this study, since only Canadian exports are under review, such an error would not come into play.

“The Bronze Medal Mistake”:

If the “gold medal mistake” is not made, the bronze medal mistake cannot occur. This mistake arrives when trade flows are inappropriately deflated, which may then cause spurious correlations and biases. In the case of this study, as trade flows are used in their nominal form, this error should not occur.

Beyond the above errors identified by Baldwin and Taglioni (2006), there is another issue that has come to light in recent years – the estimation of zero-trade data. The problem of zero-trade data occurs because the OLS gravity equation is most commonly estimated using OLS in its logarithmic form:

	Equation 5

In this study proxies for trade barriers include distance, MRT terms, as well as a dummy variable representing common language. Other common proxies for trade costs include adjacency,

common language, colonial links, common currency, and whether or not a country is landlocked. Estimating the gravity equation in its log form forces all the zero terms to be dropped from the estimation. The OLS regression is then estimated solely on the positive values. The claim is that without taking the zeros into account the OLS estimates tend to be biased.

In order to address the above issue, Santos-Silva and Tenreyro (2006) suggest the use of a Poisson pseudo-maximum likelihood (PPML) method. They claim that the gravity model (log-linearized model) can be severely biased in the presence of heteroskedasticity and subsequent interpretation of parameters as elasticities could mislead policy implications. Notably, in the specific case of the gravity model, the distance parameter is found to have less of an effect on trade data (value of exports and/or imports) according to the PPML method. Using the PPML approach serves as both a robustness check and a mechanism to address biases found in the traditional OLS approached in the empirical section of this paper.

IV. Methodology and Data

This section specifies both the model and the data used in the empirical analysis. It identifies the various robustness checks as well as the data limitations that direct the lines of the investigation.

Model

Most commonly, the gravity model is estimated using panel data. Here the analysis is limited by two time observations. In order to establish the variety of effects that the six governance

indicators may have on the value of Canadian exports of small/medium versus large firms three basic models will be tested. Specifically, the effect of the governance indicators and the controls (GDP, PCGDP, distance, common language, and remoteness) will be regressed on the total value of Canadian exports for firm group i to country j at year t (2002 or 2008).

To begin with, all three will be tested using the OLS methodology. Such a methodology automatically omits zero-trade data as the equation when the logarithmic form is employed. Firstly, in order to establish the level effect, by way of a simple dummy, of being an SME versus a large firm, the first model will be one without interactive effects. In this first iteration the controls will be added one by one to the model in order to establish their significance. The results of these regressions may be found in Table 1.1 in section VII. (Tables).

Initial specification to identify the level effect:

	Equation 6

The right-hand-side (RHS) of equation 6 includes the following variables. The first variable, , denotes the natural logarithm of the GDPs of country *j* in year *t*. Subsequently, the natural logarithm of per capita GDP of county *j* in year *t,* is represented. Variable indicates the natural logarithm of bilateral distance between Canada and country *j.* The distance is measured as the distance between the two most populous cities of the trading pair. Common language also presents itself as a dummy variable with a value of 1 (0) if Canada *j* share (do not share) a common language. These are all standard variables in traditional gravity equations. The variable remoteness , as calculated by equation 3, is included as a proxy for the MRT, as discussed in the previous section. The three variables after the standard gravity variables, before the governance variables are dummy variables taking the size of the enterprise, year (if 2002=0 and if 2008=1) and interactive effect between the two into account. The WGI variables are identified as voice and accountability (VA), political stability and absence of violence (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL) and control of corruption (CC).

Following the examination of the level effect, a semi-interactive model will be tested, in order to identify whether or not the governance variables have a distinct effect on the exports of small/medium versus large enterprises while assuming that the controls have the same effect across firms of all sizes.

	Equation 7

The six additional variables in equation 7 represent the interactive effect of the governance indicators, and the size of the Canadian exporting enterprise represented by the Large dummy. To achieve these variables, the large dummy is multiplied by the individual governance indicators - hence "interaction". These variables are not represented in their logarithmic form, and as such have considerably smaller coefficients than the variables in logarithmic form. The governance variables have been normalized from their original form, lying between -2.5 and 2.5 as estimated by an unobserved components model, in order to lie between 0 and 100 (Berden, Bergstrand and Etten 2012).

The third model to be tested is a full interactive model, which explores the effect of each independent variable, including the typical gravity controls, separately on the value of exports of SME versus large firms. For ease of analysis, two separate regressions will be run to test the fully interactive model - one on the SME data and one on the large enterprise data using equation 6. This is equivalent to testing a fully interactive model. Subsequent models are considered by way of alternative specifications driven by either econometric or theoretical considerations, as described in the previous section.

According to the theory driven decomposition described at the end of the last section, the left-hand-side (LHS) variable, in addition to the value of exports, may be specified in two other ways: number of Canadian exporting enterprises by size of enterprise and average value of Canadian exports by size of enterprise. Following the method used by Lawless (2010), the value of exports is decomposed into its two margins: extensive (number of enterprises) and intensive (average value of exports). Taking the natural log of each to the LHS variables, the traditional gravity model set up is followed. Although normally Canadian trade data would not have any zero-data points, in the data set there is some zero-value trade data as Canadian exports, upon disaggregation according to firm size, are either not reported due to their very small value (< $30,000) or Canada does not export to those countries by that firm size group.

After considering the common form of the gravity model augmented by the governance indicators and enterprise size of exporters, a robustness analysis is conducted. Robustness checks are completed to address the issue of zero-trade data, possible heteroskedasicity, and time variance. The first adjustment to the model follows Silva Santos and Tenreyro (2006). According to these authors, due to Jensen's inequality, estimates conducted with the OLS methods are potentially biased and heteroskedasic. The suggested solution is a Poisson pseudo-maximum likelihood (PPML) method that includes zero-trade data. In the case of the PPML method the value of exports (and all dependent variables) are used in their natural form, rather than their logarithmic form.

The next robustness check addresses the issue of time variability. As data is available for only two points in time, analysis of the variation of the parameters over time is somewhat dubious. Nonetheless, in order to address this issue as comprehensibly as possible, while taking full advantage of the data available, both a pooled OLS estimation and panel feasible generalized least squares (FGLS) estimation is performed in addition to the cross-section regressions.

Limited by a two-period data set, the data here is certainly cross-sectionally dominant. The most natural inclination is to pool the data in such a situation. Pooling data comes with some challenges though. There are five possible complications with pooling data. All the complications have to do with the errors. Potential challenges may arise in the following ways: the errors are not independent from one period to the next, the errors are correlated across nations, the errors are heteroskedastic, the errors contain both temporal and cross-sectional components concealing unit and period effects, and the errors may be non-random across temporal or special units. When the robustness of OLS estimates is tested by way of a FGLS panel method they deviate very little from the OLS estimates. As such the results of this test are not presented or included in the discussion of the empirical results. The FGLS analysis serves to support the robustness of the OLS analysis.

Data description

The data for the LHS variables (volume of Canadian exports, number of exporting firms, and average value of exports per firm), and those relating to Canadian exporters' enterprise size are annual observations for the years 2002 and 2008 from the Canadian Exporter Registry

maintained by Statistics Canada. Firm size in this paper follows the Exporter Registry's definitions of firm size. Typically, either the number of full-time employees or the value of gross revenue denotes firm size. While the definition of small, medium and large firms can vary, for the purposes of this paper we will assume that any firm employing less than 500 people is small or medium sized; implying that any firm employing 500 or more employees is considered large. Looking at the value of exports in the Exporter Registry, one finds, when aggregated, the total value of exports in this database varies from the official Statistics Canada totals. This is due to the fact that any firm's exports that fall below $30,000 are not included in this Registry. This difference amounts to less than 10% of total exports for both of the years under review.

Moving on to the international data, the GDP data for Canada's trading partners are collected from the International Monetary Fund's World Economic Outlook Database. While the standard, time-invariant gravity model variables such as distance between dyads and common language come from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) gravity database developed by Head, Mayer, and Ries (2010). The governance indicators are funded by the World Bank, but are produced by Daniel Kaufmann of the Brookings Institution, Aart Kraay of the World Bank Development Research Group, and Massimo Mastruzzi of the World Bank Institute. The data utilized to construct the WGIs are amassed from a number of international organizations, think tanks, non-governmental organizations, survey institutes, and private sector firms (Kaufmann, Kraay and Mastruzzi 2010). The WGIs have been available on an annual basis since 1996.

A table summarizing the descriptive statistics of the variables used in the empirical analysis may be found in Appendix C.

Data constraints

The dataset is limited by both the research question as well as the availability of observations. The data, while available for a large cross-section, are limited in two aspects. Firstly, the data is limited to Canadian exporters. This implies that only one-way trade is reviewed, i.e., Canadian exports to the world. Secondly, the data is limited to two time observations – 2002 and 2008. Further, with the research question's focus on the performance of Canadian exporters, only bilateral trading relationships with Canada are being reviewed.

V. Empirical Results

Level Estimates

To begin with, in order to clearly establish the general relationship between Canadian exports and governance, seven regressions are run using the pooled two-period dataset. Results of these regressions can be found in Table 1.1 (section VII. Tables). The empirical interaction of firm size and the individual WGI variables is tested in the next section. Characterizing the regression is equation 6 found in the section IV. The table shows the results of the relationship between the total value of Canadian exports by group i, firm size (SME vs. large), to destination j are and the independent variables of interest. The independent variables are listed in the first

column of the table.[3] The initial column of results shows the regression of the six governance indicators on the total value of Canadian exports in addition to the dummy variable identifying the size of the enterprises. Each additional column adds one more control variable. All of the controls used in the models here are included in a typical OLS gravity model. As seen in the growth of the R-squared as each control is added, their significance and requirement becomes clear. The discussion of the variables' coefficients is organized into three sections: a "GDP" section, a section addressing the traditional bilateral trade barriers, and a final section on the innovative governance indicators. Since the stepwise addition of each variable in the first six columns does not significantly affect the coefficient of the governance indicators, we concentrate our discussion on the last column, which represents the full model.

GDP Variables

Consistent with traditional results the regressions here indicate that the GDP of destination countries has a positive overall effect on the exports to that country. Given that both the dependent and independent variables are in their natural logarithmic forms, the coefficients here may be interpreted as elasticities. The coefficient for GDP is very close to the expected value of unity (1). Per capita GDP's influence is non-significant and, as is common, has an ambiguous sign.

Traditional Gravity Model Variables

Second, the variables representing proxies for trade barriers come under review. Analyzing the

[3] The dependent variable is noted in the first row of each table. Most often the dependent variable is that of the total value of Canadian exports by firm group i to country j.

effect of the log of distance on Canadian export flows, it is clear that it has a negative effect across the specifications. While the distance coefficient is larger than the expected value of negative unity the OLS estimates fall close to the common range of estimates. Indeed, according to a meta-analysis of 103 papers utilizing the gravity model, 90 percent of estimates fell in the range of -0.28 and -1.55 (Disdier and Head 2008). Given that the data here is representing exports according to firm size, it is unsurprising that distance is shown to have a greater effect on firm level data. Research utilizing American firm level exporter data has also found that distance has a greater effect than negative unity (Bernard et al 2007).

Unlike distance, both common language and remoteness are expected to have a positive influence on exports abroad. Easily understood to hasten trade, common language should support the exchange of goods. Remoteness, on the contrary, is somewhat less straightforward. The suggestion is that the more "remote" a country is from the rest of the world, the more likely it is to encourage trade with the partners with whom it already trades. This is similar to a "fixed costs" argument, given that when the threshold of the fixed cost is passed there is an incentive to invest further. The OLS estimates show the economic hypotheses to be verified here.

The "Large Dummy" variable and what it represents is the methodological innovation in the regressions here. Testing the difference between the exports by SMEs and large firms, it comes in negative by the OLS estimates. Interestingly, it indicates, being 0 when a firm is an SME and 1 when large, at a significant level, that large firms export to a smaller number of destinations.

This implies that SME have a broader export network and are more likely to export to any given market. Larger firms tend to focus their efforts to a smaller number of markets. Whether this is done to reduce risk, or simply to take advantage of economies of scale, cannot be identified by this model. This relationship is explored further in later sections of the paper as the effect of different trade barriers (governance indicators) are tested for their interaction with the exports of differently sized firms.

WGI Variables

The representation of trade barriers (enhancers) in the model is extended to include indicators of the governance of the exports' destination states. Expected to have varying effects on trade, we find that at minimum three of the governance indicators have a significant effect on Canadian exports by firm size, according to OLS estimates. An important finding in Table 1.1 is that Voice and Accountability (VA) has a significantly negative effect on exports. This is as anticipated as this variable best captures the level of pluralism in the partner country. Since the WGIs are normalized to lie between 0 and 100 in our model, a one-unit change in the VA index diminished exports by 0.024 percent. This finding is consistent with findings that increasing democratic pluralism in a destination restricts trade (or in this case exports) despite some suggestions that democracy supports trade liberalization (Li and Resnick 2003). Some suggest that the reasons for the increased barriers to trade as pluralism increases stem from the fact that politicians want to provide the illusion of a liberalized market by reducing tariff barriers, while protecting home industries by way of non-tariff barriers (Kono 2006). Increased pluralism may also allow vocal minorities to oppose trade if they believe that more liberal trade may disadvantage them.

The next WGI, Political Stability and Absence from Violence (PV), indicates a small negative influence on exports to that country. While this finding may seem contradictory, the relationship between political stability and trade flows remains ambiguous. Indeed there may be situations where political instability calls for increased trade flows due to materials requirements and international involvement. There is little literature on this relationship, and more research is required in order to more fully understand the complexity of this correlation.

One would expect trade to occur more frequently in environments where governments are run effectively. Government effectiveness (GE) is the first of the two governance indicators that are have insignificant effects across the final regression specifications. Nonetheless, the indicator does have the expected positive sign in the OLS estimations.

Naturally, just as in the case of strengthened government effectiveness and the rule of law, one would expect trade to be stimulated by improved regulatory quality. There are arguments to be made that increased regulations may hinder the competitive nature of a market, but it has been established that some base level regulations are required for markets to function at all (Dollar and Kraay 2003). This opacity about the "perfect" level of regulation is evidenced in the inconstant results across the regression specifications as seen in Table 1.1 and 1.2 in section VII (Tables).

The third WGI with consistently significant effects on Canadian exports is the Rule of Law (RL)

indicator. Predictably, the rule of law has an important positive effect in encouraging exchange between trading partners. If firms are able to trust the rule of law under which they are selling their goods they are more likely to continue bargaining. Indeed this supports the well-established importance of property rights in encouraging market functionality.

Finally, the Control of Corruption indicator is the second governance indicator without a significant effect on Canadian exports to their international partners. This does not come as a surprise as corruption is often shown to have conflicting effects on the economy. The Indian example comes to mind, as corruption is a part of everyday life, and yet in recent years the country has experienced tremendous growth in trade and other economic aspects. Now it seems that the growth is slowing down, and some claim that this is due to corruption's continued hold on the country. Nevertheless, the turn of events suggests that up to a certain threshold corruption may prove to be a stimulating economic factor.

Semi-Interactive Estimates

While the level estimates may show that there is a difference between the exports of SME's and large firms, the previous analysis cannot identify interaction effects between independent variables. In the case that an interaction effect exists, the impact of a variable is conditional on the level of another. This section empirically explores such an interaction. The equation that defines the regressions discussed in this section is equation 7 identified in section IV. The question being addressed is whether the variable characterizing a small/medium sized Canadian firm interacts with the governance environment of a destination in order to affect the

level of exports. Identifying the level of governance in our model are the six WGIs. Differing from the previous level estimates, the test here enhances the traditional gravity model with dummy variable interactive effects between the size dummy "Large Dummy" and the six WGIs. Control variables (those typical of most gravity models) are assumed to have identical effects across firms' size in this semi-interactive model. The table displaying the results discussed in this section is table 2.1 in section VII. (Tables).

Due to the restricted number of time observations, time related conclusions are difficult to make. The larger number of observations in the pooled data often allows for more significant results, but does not allow for an across time analysis. The presentation of the 2002 and 2008 data are shown to give some understanding of the changes that occurred over the six year time period.

The common gravity variables were discussed in the previous section and do not differ in their expected values or significance levels: GDP has a near positive unity effect on exports (coefficient = ~1.00), distance has a negative effect, and both common language and remoteness have positive effects. The effects are seen across the three regressions identified by the three columns in table 2.1. As in the base model, voice and accountability (VA) and political stability and absence of violence (PV) of the destination countries have negative effects on the total value of exports. The effect of government effectiveness (GE), regulatory quality (RQ) and the rule of law (RL) all have the expected positive effect on exports, although only the rule of law estimates are somewhat significant. The control of corruption (CC) variable has a

negative effect, and is once again non-significant. The Large dummy has the same results as well.

The year dummies come in as insignificant, and this indicates that there is not enough evidence to make any conclusions about there being any great difference between the two periods.

Testing the difference between SME and large firm's exports to destinations based on governance environments, the estimation indicates that there is very little significance except for the control of corruption. The positive sign on the LargeCC variable indicates that large firms are more likely to export to countries with lower levels of corruption. This result falls in line with the previous finding that large firms are exporting to a smaller variety of destinations. Indeed this qualifies the initial OLS result, seen in the final column of Table 1.1, by characterizing the exporting of large Canadian firms to countries where corruption is under an increased level of control. Of the other governance indicators, although not significant in their effects, only government effectiveness has the expected positive sign. There is some room for debate on the signs of the RQ variable as well as the PV and VA variables due to the ambiguity of their effect on exporting, but as they do not play a significant role in the model they will not be expanded upon here.

Fully Interactive Estimates

Going beyond the difference in exports based on governance environment, exports according to firm size may also differ across the controls. This third model tests full interaction between the export groups by size of firm and all the independent variables. To simplify analysis,

equation 6 is used to regress SME and large firms' exports on the independent variables separately. This method is equivalent to that of interacting the size dummy with each individual independent variable separately. Further, in order to improve the estimation by having the largest number of observations possible, only a pool of 2002 and 2008 data is presented here. The results of this exercise are displayed in Table 3.1 in section VII. (Tables).

Although the effect of governance seems to vary little across the Canadian exports according to size of enterprise, exports differ by size of firm by way of the gravity controls. Generally, large firms seem to be more affected by the gravity control variables than SMEs. While per capita GDP remains insignificant when the model is tested using OLS, the four other gravity control variables are found to be significant at the 1% level across SME and large firms. Having all the expected signs and relatively similar value to earlier OLS estimate, in the fully interactive estimation one is able to identify the difference between SME and large firm's relationship with the gravity controls.

GDP is found to have a near positive unity effect for both SME and large firms, but is found to have a stronger positive effect on large firms' exports. Distance, as usual, has a negative effect on exports, but it has a slightly larger negative effect on large firms' exports. The only variable that has a somewhat stronger effect on SME exports compared to large firms' exports is common language. Common language has a somewhat stronger positive effect on SME exports compared to large firms' exports. The greatest difference in the effect of an independent gravity control variable on firms' exports is found to be remoteness, with almost a full point difference between the two. This effect is not surprising, as the remoteness indicators is most

simply understood as a fixed cost effect, and thus once a large firm crosses the threshold of trading with a "remote" nation it likely has a greater capacity to invest in that relationship by way of exports. This result is particularly interesting when compared to the fact that distance has a greater negative effect on large firms. Combining these two results then implies that although larger firms have a harder time exporting to farther destinations, once they invest in trading with remote destinations they "give it their all".

Estimates for the governance indicators display the same trends identified by the semi-interactive model. VA and PV both have significant negative effects on the exports of SMEs and large firms, but neither affects the firm groups differently. While government effectiveness has a somewhat significant positive effect on SMEs exports it does not have a significant effect on exports of large firms. The rule of law indicator has a positive effect on exports of both sizes of firms, but does not show any significant variance. Control of corruption is the exception in terms of having a different effect on the exports of the exports of SME versus large firms, but the variable does not have a significant effect on either of the firm groups' exports.

Gravity Decomposed

Following the theoretical work of Melitz (2003) and the empirical study by Lawless (2010), the gravity model is decomposed into two elements: the extensive and intensive margin. Since this is a log linear OLS decomposition, the coefficients of the two elements of the decomposition add up to the coefficients found in the original OLS model. The observations are still grouped into either SME or large Canadian exporters in order to identify possible disparities between exporters based on firm size. Decomposition of the original gravity model allows for a better

understanding of how the effects of the independent variables vary across either of the margins. Indeed, there is some evidence that the weight of the effect of the common gravity model is on the extensive margin (Lawless 2010).

The equation characterizing the decomposition is defined in section III (Gravity Model Overview). Following the semi-interactive OLS model, in order to further explore if governance affects the exports of SME and large firms differently, equation 7 of section IV (Methodology and Data) typifies the regression. Differences between the original semi-interactive and the decomposed semi-interactive models lie in the dependent variables. The dependent variables in the decomposed models are altered to be the number of firms exporting to each destination market - the extensive margin estimates; and the average value of exports per firm being sent to each destination - the intensive margin estimates.

Table 4.1 in section VII (Tables) presents the result of decomposing our OLS model. The positive effect of GDP and negative of distance are about equally spread across the extensive and intensive margins with half the effect on each margin. Interestingly, the per capita GDP (PCGDP) is significant for both margins and has a positive effect on the extensive and a negative on the intensive, implying that while a higher per capita GDP encourages exporters into a market it does not support the expansion of the volume of exports on average. Here the common language variable has a slightly larger effect on the intensive margin – thus language supporting the higher levels of exports once a firm has entered a market. The effect of remoteness on the decomposed margins follows the trend found by other researchers and is more intense on the

extensive than the intensive margin. The increasing remoteness of a market from the rest of the world thus encourages more exporters to enter it rather than impacting average exports.

The case of the individual WGIs in the decomposed model is notable, as all of them have a significant effect on the extensive margin for the pooled data. As in the base case VA, PV and CC have a negative effect on the extensive margin. For both VA and CC this negative effect is greater on the extensive than the intensive margin. GE, RQ and RL have the expected positive effect on the number of firms in a market, suggesting that a larger number of Canadian exporters are more confident in entering markets that are well governed according to these three indicators.

As anticipated, the effect of being a large firm has a greater (negative) impact on the number of firms rather than the value of average exports sent to international markets, identified by the negative coefficient on the size dummy in the regression on the extensive margin (A). Two of the six interactive effects identifying the differences between SME and large firms' exports with regards to their reactions to the destination market's governance environment are significant. PV on balance has a negative effect on the non-decomposed model, but when broken down has a small positive effect on the extensive margin and a somewhat larger effect on the intensive margin. The effectiveness of a government on the other hand has an on-balance positive effect on the whole model, and a small negative effect on the extensive margin and a larger positive effect on the intensive margin. For larger firms, this hints that increased average exports are

encouraged by the effectiveness of the destinations' government. As the rest of the interactive effects are non-significant in the decomposed model is not explored.

Sensitivity Analysis

Over the past ten years there have been important developments in the gravity model's empirical specification that any analysis today would be amiss to leave out. Notably, the work of Santos Silva and Tenreyro (2006), due to Jensen's inequality, addresses issues of heteroskedasticity and zero-trade data that arise when OLS estimations are employed. To amend these errors the researchers suggest estimating the gravity equation using a Poisson Pseudo Maximum Likelihood (PPML) method using levels rather than logs. In this section of the paper such a method is employed as a robustness check. After each of the OLS estimations: level, semi-interactive, fully interactive, and decomposed models in section VII (Tables), the same estimation is completed using PPML methodology. This section discusses the results found in table 1.2, 2.2, 3.2, and 4.2.

For the level estimates results are displayed in table 1.2. As in Table 1.1 the controls are added one by one to the RHS side of the equation until the complete model is achieved in the final column. The results are very similar for most variables of interest. By exception, the PPML estimate of the effect of distance on exports came in at a much lower -0.676 – below unity. Santos-Silva and Tenreyro (2006) observe that the effect of distance diminishes under the PPML methodology, as the biases in the OLS methodology fall away. A quick overview of the common gravity variables in the final column's complete model shows that they all retain a significant

effect on export values. GDP variables have a significant positive effect, distance has a negative effect, and common language and remoteness both have positive effects. It is noteworthy that neither the level of the effect of common language nor that of remoteness falls significantly when estimated by the PPML method. It is really only distance that loses some of the weight of its effect under this estimation method. Additionally, the WGI regulatory quality also appears to have significant impact on exports occurs in the PPML specification.

In contrast to the previous OLS estimates the four out of the six individual WGI estimates are significant in this PPML estimate. Regulatory quality and rule of the law continue to have their expected positive impact on exports. Likewise the indicators of VA and PV, being characterized by more “pluralistic” factors continued to have their negative impact. By the PPML estimation, government effectiveness changes to have an insignificant negative effect on Canadian exports. Control of corruption continues to have an insignificant negative effect. These results suggest that the governance of countries does indeed have an impact on export levels for Canadian firms in general.

Coming to the semi-interactive model presented in table 2.2, none of the interactive parameters in the PPML estimates have a significant impact on exports. Non-significance in this regression does not imply that small and large firms do not react differently when faced with the same international environment, but that that these categories may not be the correctly specified. This estimations shed light on the very broadly defined SME and large Canadian firms may not be precise enough. It may be that within the categories of SME and large Canadian

firms there are firms in industries that are more or less sensitive to the parameters being tested here. It remains that while there may be certain factors that define SMEs and large firms in Canada generally, they may not react to foreign environments in patterns according to these expansive categories of firm size alone.

(A more extensive exploration of the factors that define SME versus large Canadian exporters based on a modified set of governance indicators may be found in Appendix B.)

Table 3.2 presents the results of separating the SME and large firm's data and running the regressions separately using equation 6 from section IV (Methodology and Data). Upon testing fully interactive model, the differences between the effects of the typical gravity controls on the exports of Canadian SMEs versus large firms as identified by the OLS methodology fall away. Unlike in the OLS estimates, per capita GDP has a significant positive effect, if only on the exports of large firms. Comparably to the OLS estimates all the other gravity controls (GDP, distance, common language, and remoteness) have a significant effect on the exports of Canadian SME and large firms. GDP has its usual effect of about positive unity. Distance has a negative effect somewhat lower than the OLS estimates. Common language and remoteness both have a stronger positive effect on the exports of all sizes of Canadian firms. These results bring the differences identified by the OLS estimates into question, despite serving to support the robustness of the signs trends identified by the OLS methodology.

Decomposing the PPML estimates into their extensive and intensive margins identifies how the

effects of the parameters break down across firms and the average value of exports/firms respectively. These results are found in table 4.2 in section VII (Tables). As in previous studies, much of the effect of the parameters is delivered on the extensive margin. It is interesting to note that some of the parameters have a significant effect when the margins are estimated separately.

Not unlike the integrated estimates of the common gravity variables, the separated margins have the expected effects. The GDP variables have a positive, relatively balanced, impact on both margins; while distance has a negative effect on both margins. The common proxies for other aspects of trade barriers, common language and remoteness, both have a positive effect on the margins. Unsurprisingly though, Remoteness has a larger effect on the extensive margin.

Governance has a continued effect on the margins. Significant effects are really only felt on the extensive margin. To that end the majority of the weight of the effect is also on the number of firms. Following the effects felt at the more aggregate gravity model, PV, VA, and GE all have negative impact on the extensive margin. Regulatory quality, with a negligible effect on the intensive margin has a positive effect on the extensive margin; as does the rule of law. CC continues to have a mostly insignificant effect. Uniquely, among the interactive group of parameters, PV has a positive effect on the extensive margin implying that a higher number of large Canadian exporters are encouraged into markets with a better performance in the PV governance indicator.

The interactive effects GE and CC have some significant effects in the decomposed intensive margins. These effects support the findings of the previous OLS and subsequent FGLS estimates, as they both have and on-balance positive effect on the exports of large Canadian exporting firms. It is interesting to note that both of the parameters have a bigger positive impact on the intensive margin (average exports per enterprise).

VI. Conclusion

This exposition has served to show the relationship between the volume of Canadian exports, grouped by firm size, and a variety of international environments. The analysis was motivated by the hypothesis that the governance environments of export destinations would affect the volume of exports by SMEs and large firms differently. Although this hypothesis proved to only be true for a small number of governance variables, governance was shown to have a significant effect on Canadian exports in general. Three of the six governance variables were found to have a significant effect on Canadian exports under the OLS methodology, while an additional one was found to be significant using PPML. Of the governance indicators found to have a significant effect on Canadian exports in general, two, voice and accountability and political stability and absence of violence were found to have a negative effect; and two, rule of law and regulatory quality, were found to have a positive effect. Notably, rule of law only became significant under the PPML estimation methodology. These findings suggest that while governance is an important factor affecting Canadian exports, in order to fully understand the relationship, it is indeed important that the different aspects of governance be disaggregated as its different elements have competing effects.

An interesting finding in running the interactive model was that although most of the governance indicators were not found to have a differing effect on the Canadian exports delineated by size of firm, most gravity model controls did. Control of corruption is the only WGI that seems to have a significantly different effect on exports of SMEs and large firms – large firms export more when there is a greater control of corruption relative to SMEs. This finding is only significant using OLS methodology. Coming to the gravity control variables, though, GDP, distance, and remoteness all affect the exports of large firms more than the exports of SMEs. Following their regular patterns, both GDP and remoteness have a greater positive effect on large firms' exports, while distance has a greater negative effect on large firms' exports. Uniquely, the common language indicator has a great positive effect on SME exports. The only gravity control that did not have a significant effect on exports at all was per capita GDP. As with the difference found for the WGI indicators, the differences for the gravity model indicators are only found to be significant using OLS.

Finally, decomposing the dependent variable of exports into its intensive and extensive margins, one finds that most of the effects found in the initial regressions manifest themselves primarily on the extensive margin. This implies that most of the effects described previously affect the number of firms exporting to certain international destinations rather than the average amount of exports being sent to those destinations. Interestingly, in addition to the control of corruption indicator, political stability and absence from violence as well as government effectiveness are found to have significant interactive effects with the size of enterprise variable on the decomposed margins. Both of these interactive variables, though, have opposing and counteracting effect on the margins explaining away the difference as identified in the aggregated regressions.

VII. Tables

Table 1.1: Level Estimates (OLS)

Ln Value of Canadian Exports (Pool of 2002 and 2008)							
Large Dummy	-0.371	-0.433	-0.433	-0.441	-0.440	-0.446	-0.446
	(0.186)**	(0.101)***	(0.101)***	(0.091)***	(0.088)***	(0.081)***	(0.081)***
VA	-0.022	0.012	0.012	-0.011	-0.014	-0.023	-0.024
	(0.009)**	(0.005)**	(0.005)**	(0.005)**	(0.005)***	(0.005)***	(0.005)***
PV	-0.049	-0.014	-0.014	-0.017	-0.010	-0.013	-0.012
	(0.009)***	(0.005)***	(0.005)***	(0.005)***	(0.005)**	(0.004)***	(0.004)***
GE	0.155	0.009	0.010	0.024	0.022	0.014	0.014
	(0.022)***	(0.013)	(0.013)	(0.012)**	(0.011)*	(0.011)	(0.011)
RQ	0.002	0.001	0.001	-0.010	-0.005	-0.003	-0.003
	(0.017)	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)
RL	-0.032	-0.021	-0.021	0.006	0.001	0.025	0.026
	(0.021)	(0.012)*	(0.012)*	(0.011)	(0.011)	(0.010)**	(0.010)**
CC	-0.010	0.027	0.027	0.011	0.007	-0.001	-0.001
	(0.016)	(0.009)***	(0.009)***	(0.008)	(0.008)	(0.008)	(0.008)
Ln GDP		0.962	0.958	0.974	1.031	1.048	1.053
		(0.028)***	(0.029)***	(0.026)***	(0.027)***	(0.025)***	(0.027)***
Year Dummy			0.065	0.039	-0.020	-0.038	-0.018
			(0.104)	(0.093)	(0.091)	(0.084)	(0.094)
Ln Distance				-1.404	-1.465	-1.611	-1.628
				(0.128)***	(0.125)***	(0.116)***	(0.122)***
Common Language					0.591	0.539	0.536
					(0.100)***	(0.093)***	(0.093)***
Ln Remoteness						2.197	2.195
						(0.237)***	(0.237)***
Ln PCGDP							-0.029
							(0.060)
Constant	0.906	-7.309	-7.310	5.752	5.535	-12.962	-12.699
	(0.344)***	(0.298)***	(0.299)***	(1.223)***	(1.185)***	(2.273)***	(2.341)***
R^2	0.29	0.80	0.80	0.84	0.85	0.87	0.87
N	528	511	511	511	511	511	511

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table 1.2: Level Estimates (PPML)

Value of Canadian Exports (Pool of 2002 and 2008)							
Large Dummy	0.427	0.428	0.428	0.428	0.428	0.428	0.428
	(0.790)	(0.095)***	(0.085)***	(0.053)***	(0.045)***	(0.035)***	(0.034)***
VA	0.017	-0.006	-0.015	-0.022	-0.025	-0.020	-0.024
	(0.071)	(0.013)	(0.011)	(0.008)***	(0.007)***	(0.005)***	(0.005)***
PV	-0.110	-0.064	-0.061	-0.046	-0.008	-0.014	-0.024
	(0.019)***	(0.010)***	(0.008)***	(0.008)***	(0.008)	(0.006)**	(0.006)***
GE	-0.016	0.006	-0.018	-0.011	-0.031	-0.032	-0.027
	(0.040)	(0.040)	(0.034)	(0.025)	(0.024)	(0.020)	(0.019)
RQ	0.110	0.057	0.098	0.050	0.038	0.046	0.037
	(0.040)***	(0.023)**	(0.022)***	(0.021)**	(0.019)**	(0.016)***	(0.014)***
RL	0.182	-0.011	0.042	0.044	0.006	0.015	0.021
	(0.239)	(0.020)	(0.022)*	(0.013)***	(0.014)	(0.011)	(0.010)**
CC	-0.043	0.017	-0.040	-0.026	0.002	-0.004	-0.014
	(0.133)	(0.019)	(0.020)**	(0.017)	(0.012)	(0.012)	(0.012)
Ln GDP		1.667	1.630	1.323	1.272	1.180	1.124
		(0.066)***	(0.061)***	(0.079)***	(0.064)***	(0.060)***	(0.052)***
Year Dummy			-0.858	-0.657	-0.463	-0.462	-0.614
			(0.171)***	(0.167)***	(0.144)***	(0.121)***	(0.133)***
Ln Distance				-0.911	-0.867	-0.695	-0.676
				(0.184)***	(0.161)***	(0.143)***	(0.142)***
Common Language					1.029	0.988	1.000
					(0.197)***	(0.171)***	(0.172)***
Ln Remoteness						2.141	2.279
						(0.311)***	(0.315)***
Ln PCGDP							0.308
							(0.104)***
Constant	-3.868	-17.037	-16.273	-2.793	-2.094	-22.210	-24.519
	(3.667)	(1.121)***	(0.986)***	(2.679)	(2.143)	(3.489)***	(3.680)***
R^2	0.07	0.99	0.99	1.00	1.00	1.00	1.00
N	768	710	710	710	710	710	710

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table 2.1: Semi-Interactive Estimates (OLS)

Ln Canadian Exports	Pool	2002	2008
Ln GDP	1.053	1.079	1.034
	(0.026)***	(0.037)***	(0.038)***
Ln PCGDP	-0.027	-0.056	-0.002
	(0.059)	(0.083)	(0.085)
Ln Distance	-1.630	-1.718	-1.540
	(0.119)***	(0.169)***	(0.170)***
Common Language	0.532	0.444	0.668
	(0.091)***	(0.128)***	(0.131)***
Ln Remoteness	2.204	2.454	1.881
	(0.231)***	(0.321)***	(0.347)***
VA	-0.022	-0.025	-0.019
	(0.006)***	(0.009)***	(0.008)**
PV	-0.006	0.001	-0.009
	(0.006)	(0.008)	(0.008)
GE	0.004	-0.017	0.025
	(0.014)	(0.020)	(0.020)
RQ	0.003	0.001	0.002
	(0.010)	(0.015)	(0.015)
RL	0.030	0.038	0.020
	(0.014)**	(0.019)**	(0.022)
CC	-0.015	-0.004	-0.026
	(0.010)	(0.014)	(0.016)
Large Dummy	-1.217	-1.391	-1.283
	(0.302)***	(0.391)***	(0.438)***
Year Dummy	0.075		
	(0.121)		
Large*Year Dummy	-0.184		
	(0.159)		
Large*VA	-0.003	-0.006	-0.004
	(0.008)	(0.011)	(0.011)
Large*PV	-0.013	-0.018	-0.008
	(0.008)	(0.011)	(0.011)
Large*GE	0.022	0.015	0.030
	(0.019)	(0.026)	(0.028)
Large*RQ	-0.011	-0.012	-0.007
	(0.015)	(0.020)	(0.022)
Large*RL	-0.008	0.020	-0.038
	(0.019)	(0.026)	(0.029)
Large*CC	0.028	0.019	0.040
	(0.014)**	(0.019)	(0.023)*
Constant	-12.382	-13.815	-10.332
	(2.290)***	(3.109)***	(3.466)***
R^2	0.88	0.89	0.87
N	511	254	257

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table 2.2: Semi-Interactive Estimates (PPML)

Canadian Exports	Pool	2002	2008
Ln GDP	1.126	1.162	1.050
	(0.050)***	(0.089)***	(0.056)***
Ln PCGDP	0.306	0.352	0.252
	(0.096)***	(0.124)***	(0.150)*
Ln Distance	-0.672	-0.607	-0.694
	(0.143)***	(0.247)**	(0.189)***
Common Language	0.995	0.703	1.084
	(0.171)***	(0.220)***	(0.219)***
Ln Remoteness	2.291	2.318	2.404
	(0.316)***	(0.358)***	(0.483)***
VA	-0.027	-0.026	-0.025
	(0.005)***	(0.007)***	(0.008)***
PV	-0.025	-0.034	-0.014
	(0.007)***	(0.010)***	(0.008)*
GE	-0.045	-0.059	-0.037
	(0.023)**	(0.032)*	(0.030)
RQ	0.038	0.035	0.045
	(0.018)**	(0.020)*	(0.026)*
RL	0.029	0.032	0.046
	(0.013)**	(0.032)	(0.022)**
CC	-0.009	0.007	-0.046
	(0.015)	(0.018)	(0.028)*
Large Dummy	-0.923	-1.291	-0.875
	(0.523)*	(0.745)*	(0.658)
Year Dummy	-0.575		
	(0.163)***		
Large*Year Dummy	-0.068		
	(0.224)		
Large*VA	0.006	-0.002	0.008
	(0.008)	(0.009)	(0.012)
Large*PV	0.003	-0.000	0.005
	(0.009)	(0.013)	(0.010)
Large*GE	0.034	0.058	0.029
	(0.031)	(0.051)	(0.038)
Large*RQ	0.000	0.013	-0.008
	(0.023)	(0.028)	(0.035)
Large*RL	-0.014	-0.016	-0.010
	(0.019)	(0.042)	(0.031)
Large*CC	-0.009	-0.029	-0.005
	(0.023)	(0.030)	(0.041)
Constant	-23.955	-25.447	-24.266
	(3.690)***	(3.882)***	(5.721)***
R^2	1.00	1.00	1.00
N	710	354	356

*p<0.1; ** p<0.05; *** p<0.01; standard errors are in parentheses

Table 3.1: Fully Interactive Estimates (OLS)

Ln Canadian Exports	SME Pool	Large Pool
Ln GDP	0.958	1.151
	(0.033)***	(0.039)***
Ln PCGDP	-0.115	0.069
	(0.073)	(0.088)
Ln Distance	-1.573	-1.701
	(0.149)***	(0.177)***
Common Language	0.582	0.483
	(0.114)***	(0.136)***
Ln Remoteness	1.799	2.640
	(0.290)***	(0.345)***
VA	-0.024	-0.024
	(0.006)***	(0.007)***
PV	-0.007	-0.017
	(0.005)	(0.007)***
GE	0.025	0.004
	(0.013)*	(0.016)
RQ	0.006	-0.011
	(0.009)	(0.011)
RL	0.022	0.030
	(0.013)*	(0.015)**
CC	-0.017	0.015
	(0.009)*	(0.011)
Year Dummy	0.219	-0.269
	(0.115)*	(0.138)*
Constant	-8.231	-18.002
	(2.872)***	(3.404)***
R^2	0.88	0.89
N	258	253

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table 3.2: Fully Interactive Estimates (PPML)

Canadian Exports	SME Pool	Large Pool
Ln GDP	1.129	1.120
	(0.064)***	(0.072)***
Ln PCGDP	0.153	0.458
	(0.122)	(0.138)***
Ln Distance	-0.627	-0.709
	(0.192)***	(0.200)***
Common Language	1.054	0.942
	(0.228)***	(0.244)***
Ln Remoteness	2.307	2.271
	(0.475)***	(0.404)***
VA	-0.025	-0.024
	(0.005)***	(0.006)***
PV	-0.023	-0.025
	(0.007)***	(0.008)***
GE	-0.046	-0.010
	(0.025)*	(0.026)
RQ	0.045	0.034
	(0.019)**	(0.020)*
RL	0.027	0.015
	(0.013)**	(0.014)
CC	-0.006	-0.021
	(0.015)	(0.017)
Year Dummy	-0.501	-0.714
	(0.176)***	(0.185)***
Constant	-23.846	-25.084
	(5.260)***	(5.009)***
R^2	1.00	1.00
N	355	355

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table 4.1: Decomposed Semi-Interactive Estimates (OLS)

(A) Ln Extensive Margin (B) Ln Intensive Margin

	Pool(A)	2002(A)	2008(A)	Pool(B)	2002(B)	2008(B)
Ln GDP	0.508	0.550	0.478	0.545	0.529	0.555
	(0.014)***	(0.020)***	(0.019)***	(0.021)***	(0.029)***	(0.032)***
Ln PCGDP	0.069	0.073	0.070	-0.096	-0.129	-0.072
	(0.030)**	(0.044)	(0.042)*	(0.047)**	(0.065)**	(0.071)
Ln Distance	-0.800	-0.794	-0.785	-0.830	-0.923	-0.755
	(0.061)***	(0.089)***	(0.084)***	(0.096)***	(0.131)***	(0.142)***
Common Language	0.225	0.283	0.209	0.307	0.160	0.460
	(0.047)***	(0.068)***	(0.065)***	(0.074)***	(0.100)	(0.110)***
Ln Remoteness	1.583	1.543	1.514	0.621	0.910	0.367
	(0.120)***	(0.170)***	(0.172)***	(0.187)***	(0.250)***	(0.291)
VA	-0.010	-0.012	-0.009	-0.012	-0.014	-0.009
	(0.003)***	(0.005)**	(0.004)**	(0.005)**	(0.007)*	(0.007)
PV	-0.014	-0.010	-0.016	0.009	0.011	0.008
	(0.003)***	(0.004)**	(0.004)***	(0.005)*	(0.007)	(0.007)
GE	0.017	-0.005	0.034	-0.013	-0.012	-0.009
	(0.007)**	(0.011)	(0.010)***	(0.011)	(0.016)	(0.017)
RQ	0.013	0.012	0.014	-0.010	-0.011	-0.012
	(0.005)**	(0.008)	(0.008)*	(0.008)	(0.011)	(0.013)
RL	0.019	0.033	0.006	0.010	0.004	0.014
	(0.007)***	(0.010)***	(0.011)	(0.011)	(0.015)	(0.018)
CC	-0.010	-0.005	-0.016	-0.004	0.002	-0.011
	(0.005)*	(0.007)	(0.008)*	(0.008)	(0.011)	(0.014)
Large Dummy	-0.811	-0.709	-1.475	-0.406	-0.682	0.192
	(0.156)***	(0.207)***	(0.217)***	(0.244)*	(0.304)**	(0.367)
Year Dummy	0.266			-0.192		
	(0.062)***			(0.098)**		
Large*Year Dummy	-0.575			0.391		
	(0.082)***			(0.129)***		
Large*VA	0.002	0.002	0.002	-0.005	-0.008	-0.005
	(0.004)	(0.006)	(0.005)	(0.006)	(0.009)	(0.009)
Large*PV	0.007	0.004	0.009	-0.019	-0.022	-0.017
	(0.004)*	(0.006)	(0.005)	(0.006)***	(0.009)**	(0.009)*
Large*GE	-0.021	-0.023	-0.018	0.043	0.038	0.048
	(0.010)**	(0.014)	(0.014)	(0.015)***	(0.020)*	(0.023)**
Large*RQ	-0.006	0.000	-0.011	-0.005	-0.013	0.004
	(0.008)	(0.011)	(0.011)	(0.012)	(0.016)	(0.018)
Large*RL	-0.001	0.000	-0.004	-0.007	0.020	-0.034
	(0.010)	(0.014)	(0.015)	(0.015)	(0.020)	(0.025)
Large*CC	0.010	0.006	0.016	0.018	0.013	0.024
	(0.007)	(0.010)	(0.011)	(0.012)	(0.015)	(0.019)
Constant	-8.871	-9.011	-7.809	-3.511	-4.804	-2.524
	(1.183)***	(1.647)***	(1.718)***	(1.849)*	(2.419)**	(2.904)
R^2	0.92	0.92	0.93	0.76	0.78	0.76
N	511	254	257	511	254	257

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table 4.2: Decomposed Semi-Interactive Estimates (PPML)

(A) Extensive Margin (B) Intensive Margin

	Pool(A)	2002(A)	2008(A)	Pool(B)	2002(B)	2008(B)
Ln GDP	0.624	0.666	0.578	0.649	0.630	0.659
	(0.032)***	(0.049)***	(0.033)***	(0.037)***	(0.063)***	(0.046)***
Ln PCGDP	0.140	0.113	0.104	0.269	0.241	0.291
	(0.067)**	(0.095)	(0.093)	(0.088)***	(0.103)**	(0.132)**
Ln Distance	-0.350	-0.359	-0.340	-0.570	-0.541	-0.546
	(0.125)***	(0.189)*	(0.166)**	(0.150)***	(0.251)**	(0.194)***
Common Language	0.604	0.593	0.587	0.599	0.278	0.770
	(0.128)***	(0.162)***	(0.169)***	(0.181)***	(0.232)	(0.238)***
Ln Remoteness	1.457	1.426	1.478	0.900	0.986	0.886
	(0.179)***	(0.263)***	(0.233)***	(0.329)***	(0.369)***	(0.492)*
VA	-0.015	-0.014	-0.015	-0.009	-0.012	-0.007
	(0.003)***	(0.006)**	(0.004)***	(0.006)	(0.012)	(0.008)
PV	-0.015	-0.019	-0.008	0.009	0.011	0.007
	(0.004)***	(0.005)***	(0.003)***	(0.007)	(0.010)	(0.010)
GE	-0.011	-0.035	-0.002	-0.034	-0.032	-0.031
	(0.010)	(0.018)*	(0.011)	(0.018)*	(0.032)	(0.021)
RQ	0.041	0.047	0.042	-0.000	-0.003	0.001
	(0.009)***	(0.012)***	(0.012)***	(0.012)	(0.017)	(0.017)
RL	0.004	0.024	0.018	0.013	0.002	0.006
	(0.009)	(0.013)*	(0.011)*	(0.020)	(0.032)	(0.029)
CC	-0.003	0.000	-0.028	-0.032	-0.019	-0.030
	(0.009)	(0.008)	(0.013)**	(0.015)**	(0.017)	(0.021)
Large Dummy	-1.156	-0.988	-1.533	0.303	-0.377	1.097
	(0.254)***	(0.322)***	(0.269)***	(0.455)	(0.419)	(0.648)*
Year Dummy	-0.195			-0.595		
	(0.128)			(0.181)***		
Large*Year Dummy	-0.298			0.475		
	(0.163)*			(0.224)**		
Large*VA	0.002	-0.007	0.006	-0.004	-0.000	-0.006
	(0.005)	(0.009)	(0.007)	(0.008)	(0.012)	(0.010)
Large*PV	0.032	0.041	0.017	-0.024	-0.036	-0.018
	(0.009)***	(0.013)***	(0.007)**	(0.008)***	(0.011)***	(0.011)
Large*GE	-0.009	-0.014	0.002	0.051	0.041	0.054
	(0.014)	(0.023)	(0.017)	(0.023)**	(0.035)	(0.030)*
Large*RQ	-0.003	0.005	-0.010	-0.038	-0.010	-0.053
	(0.013)	(0.019)	(0.016)	(0.027)	(0.022)	(0.036)
Large*RL	-0.020	-0.008	-0.050	-0.003	0.016	0.007
	(0.019)	(0.024)	(0.022)**	(0.023)	(0.033)	(0.034)
Large*CC	-0.009	-0.025	0.027	0.041	0.022	0.034
	(0.016)	(0.015)*	(0.019)	(0.020)**	(0.021)	(0.030)
Constant	-12.991	-13.141	-12.796	-11.163	-11.708	-12.258
	(2.048)***	(2.161)***	(3.016)***	(3.415)***	(3.554)***	(5.183)**
R^2	0.97	0.99	0.97	0.95	0.98	0.94
N	710	354	356	710	354	356

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

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Appendix A

This additional section explores the impacts of the WGI indicators on Canadian exports on an individual basis. The regressions show that the WGIs, each on their own, have a significant effect on the value of Canadian exports. Interestingly, all the interactive effects have a positive impact on the exports of large Canadian exporters, implying that larger companies rely on environments with higher levels of governance when they export their merchandise.

Table A: Semi-Interactive Estimates (OLS)

Ln Value of Canadian Exports (Pool of 2002 and 2008)						
Ln GDP	1.076	1.067	1.073	1.077	1.080	1.078
	(0.023)***	(0.026)***	(0.023)***	(0.023)***	(0.023)***	(0.023)***
Ln PCGDP	0.133	0.124	0.009	0.048	-0.004	-0.009
	(0.041)***	(0.052)**	(0.054)	(0.052)	(0.056)	(0.053)
Ln Distance	-1.403	-1.277	-1.314	-1.301	-1.322	-1.311
	(0.112)***	(0.107)***	(0.106)***	(0.106)***	(0.106)***	(0.105)***
Common Language	0.674	0.609	0.600	0.622	0.594	0.584
	(0.091)***	(0.090)***	(0.090)***	(0.090)***	(0.091)***	(0.091)***
Ln Remoteness	1.985	1.903	1.888	1.897	1.921	1.888
	(0.233)***	(0.233)***	(0.230)***	(0.232)***	(0.231)***	(0.229)***
Large Dummy	-1.017	-0.845	-1.479	-1.348	-1.318	-1.421
	(0.277)***	(0.271)***	(0.287)***	(0.299)***	(0.272)***	(0.262)***
Year Dummy	-0.082	-0.057	0.028	-0.005	0.032	0.036
	(0.121)	(0.124)	(0.124)	(0.124)	(0.124)	(0.124)
Large*Year Dummy	-0.200	-0.200	-0.196	-0.211	-0.191	-0.183
	(0.166)	(0.168)	(0.165)	(0.166)	(0.166)	(0.165)
VA	-0.016					
	(0.004)***					
Large*VA	0.013					
	(0.005)***					
PV		-0.011				
		(0.004)**				
Large*PV		0.010				
		(0.005)**				
GE			-0.004			
			(0.005)			
Large*GE			0.021			
			(0.005)***			
RQ				-0.007		
				(0.005)		
Large*RQ				0.019		
				(0.005)***		
RL					-0.002	
					(0.005)	
Large*RL					0.019	
					(0.005)***	
CC						-0.003
						(0.004)
Large*CC						0.020
						(0.004)***
Constant	-13.543	-14.019	-12.999	-13.414	-13.286	-12.996
	(2.345)***	(2.366)***	(2.349)***	(2.351)***	(2.340)***	(2.334)***
R^2	0.86	0.86	0.87	0.86	0.86	0.87
N	513	511	513	513	513	513

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Appendix B

In an attempt to test a smaller contingent of the governance variables and their significance in a smaller cohort; this section explores the effects of the GE, RQ, RL and CC indicators on exports as well as both margins. The focus is on the model of interest, which shows the interaction of enterprise size with the governance indicators – the semi-interactive model. The sub-set of four indicators was chosen for indicator's higher likelihood of impacting business deals. The two indicators left out: PV and VA are characterized by detailing the level of democracy, pluralism, and safety of the people from violence in the countries in question. While all of these attributes are important to good governance, they may not be as important for "good business".

Despite the validity of this effort, it just works to support the estimates presented in the main portion of this paper. As such this appendix serves to maintain the robustness of the initial results.

Table B.1.1: Semi-Interactive Estimates (OLS)

Ln value of Canadian Exports	Pool	2002	2008
Ln GDP	1.079	1.096	1.066
	(0.025)***	(0.036)***	(0.035)***
Ln PCGDP	-0.003	0.008	-0.010
	(0.056)	(0.082)	(0.078)
Ln Distance	-1.338	-1.361	-1.298
	(0.108)***	(0.148)***	(0.156)***
Common Language	0.572	0.484	0.691
	(0.091)***	(0.125)***	(0.132)***
Ln Remoteness	1.907	2.116	1.578
	(0.234)***	(0.322)***	(0.347)***
GE	-0.008	-0.040	0.026
	(0.014)	(0.020)**	(0.021)
RQ	-0.003	-0.002	-0.006
	(0.011)	(0.015)	(0.015)
RL	0.016	0.026	0.004
	(0.013)	(0.017)	(0.020)
CC	-0.008	0.009	-0.025
	(0.011)	(0.014)	(0.017)
Large Dummy	-1.356	-1.505	-1.439
	(0.299)***	(0.396)***	(0.413)***
Year Dummy	0.035		
	(0.125)		
Large*Year Dummy	-0.174		
	(0.165)		
Large*GE	0.024	0.016	0.034
	(0.019)	(0.026)	(0.028)
Large*RQ	-0.014	-0.019	-0.008
	(0.015)	(0.020)	(0.022)
Large*RL	-0.021	0.001	-0.047
	(0.018)	(0.024)	(0.028)*
Large*CC	0.029	0.024	0.038
	(0.015)*	(0.019)	(0.023)
Constant	-12.914	-14.567	-10.339
	(2.368)***	(3.217)***	(3.495)***
R^2	0.87	0.88	0.86
N	513	256	257

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table B.1.2: Semi-Interactive Estimates (PPML)

Value of Canadian Exports	Pool	2002	2008
Ln GDP	0.349	0.414	0.305
	(0.018)***	(0.031)***	(0.020)***
Ln PCGDP	0.025	0.020	0.031
	(0.040)	(0.070)	(0.045)
Ln Distance	-0.346	-0.336	-0.341
	(0.076)***	(0.126)***	(0.088)***
Common Language	0.092	0.091	0.112
	(0.064)	(0.105)	(0.075)
Ln Remoteness	0.284	0.185	0.200
	(0.165)*	(0.268)	(0.202)
GE	-0.006	-0.027	0.007
	(0.010)	(0.016)	(0.011)
RQ	-0.002	0.005	-0.004
	(0.007)	(0.012)	(0.009)
RL	0.003	0.012	-0.004
	(0.009)	(0.014)	(0.012)
CC	-0.000	0.002	-0.002
	(0.007)	(0.011)	(0.009)
Large Dummy	-0.467	-0.611	-0.394
	(0.212)**	(0.334)*	(0.240)
Year Dummy	0.019		
	(0.086)		
Large*Year Dummy	-0.048		
	(0.116)		
Large*GE	0.008	0.002	0.014
	(0.014)	(0.022)	(0.016)
Large*RQ	-0.001	0.000	-0.005
	(0.011)	(0.017)	(0.013)
Large*RL	0.003	0.018	-0.012
	(0.013)	(0.020)	(0.016)
Large*CC	-0.005	-0.013	0.006
	(0.010)	(0.017)	(0.013)
Constant	-2.049	-1.721	-0.951
	(1.680)	(2.721)	(2.034)
R^2	0.58	0.57	0.62
N	469	225	244

*p<0.1; ** p<0.05; *** p<0.01; standard errors are in parentheses

Table B.2.1: Decomposed Semi-Interactive Estimates (OLS)

(A) Extensive Margin (B) Intensive Margin

	Pool(A)	2002(A)	2008(A)	Pool(B)	2002(B)	2008(B)
Ln GDP	0.533	0.567	0.508	0.546	0.529	0.558
	(0.013)***	(0.019)***	(0.018)***	(0.020)***	(0.028)***	(0.029)***
Ln PCGDP	0.053	0.085	0.032	-0.057	-0.077	-0.041
	(0.029)*	(0.043)**	(0.039)	(0.045)	(0.063)	(0.064)
Ln Distance	-0.686	-0.654	-0.689	-0.652	-0.707	-0.609
	(0.056)***	(0.077)***	(0.079)***	(0.086)***	(0.114)***	(0.129)***
Common Language	0.274	0.324	0.246	0.298	0.159	0.445
	(0.047)***	(0.065)***	(0.066)***	(0.073)***	(0.097)	(0.109)***
Ln Remoteness	1.434	1.404	1.323	0.473	0.712	0.255
	(0.121)***	(0.168)***	(0.175)***	(0.186)**	(0.249)***	(0.287)
GE	0.013	-0.016	0.038	-0.021	-0.024	-0.012
	(0.007)*	(0.010)	(0.010)***	(0.011)*	(0.015)	(0.017)
RQ	0.009	0.009	0.011	-0.012	-0.011	-0.017
	(0.006)*	(0.008)	(0.008)	(0.008)	(0.011)	(0.013)
RL	0.003	0.021	-0.014	0.013	0.005	0.018
	(0.007)	(0.009)**	(0.010)	(0.010)	(0.013)	(0.017)
CC	-0.007	0.002	-0.015	-0.002	0.007	-0.011
	(0.006)	(0.007)	(0.008)*	(0.008)	(0.011)	(0.014)
Large Dummy	-0.732	-0.675	-1.350	-0.624	-0.830	-0.089
	(0.155)***	(0.207)***	(0.208)***	(0.238)***	(0.306)***	(0.341)
Year Dummy	0.268			-0.233		
	(0.065)***			(0.099)**		
Large*Year Dummy	-0.580			0.406		
	(0.086)***			(0.132)***		
Large*GE	-0.021	-0.021	-0.021	0.046	0.037	0.055
	(0.010)**	(0.014)	(0.014)	(0.015)***	(0.020)*	(0.023)**
Large*RQ	-0.004	0.002	-0.010	-0.010	-0.021	0.001
	(0.008)	(0.011)	(0.011)	(0.012)	(0.016)	(0.018)
Large*RL	0.005	0.003	0.005	-0.026	-0.002	-0.052
	(0.009)	(0.012)	(0.014)	(0.014)*	(0.018)	(0.023)**
Large*CC	0.010	0.004	0.017	0.019	0.019	0.021
	(0.008)	(0.010)	(0.012)	(0.012)	(0.015)	(0.019)
Constant	-8.932	-9.343	-7.323	-3.982	-5.224	-3.016
	(1.228)***	(1.677)***	(1.763)***	(1.883)**	(2.484)**	(2.888)
R^2	0.91	0.91	0.92	0.75	0.76	0.75
N	513	256	257	513	256	257

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Table B.2.2: Decomposed Semi-Interactive Estimates (PPML)

(A) Extensive Margin (B) Intensive Margin

	Pool(A)	2002(A)	2008(A)	Pool(B)	2002(B)	2008(B)
Ln GDP	0.108	0.121	0.100	0.527	0.676	0.498
	(0.004)***	(0.007)***	(0.005)***	(0.075)***	(0.163)***	(0.089)***
Ln PCGDP	0.025	0.035	0.015	0.041	0.101	0.015
	(0.010)**	(0.015)**	(0.013)	(0.160)	(0.363)	(0.186)
Ln Distance	-0.114	-0.109	-0.114	0.224	0.691	-0.005
	(0.020)***	(0.031)***	(0.023)***	(0.254)	(0.544)	(0.281)
Common Language	0.030	0.039	0.026	0.241	0.090	0.356
	(0.014)**	(0.020)*	(0.018)	(0.228)	(0.466)	(0.260)
Ln Remoteness	0.290	0.303	0.229	-1.013	-1.411	-0.674
	(0.033)***	(0.046)***	(0.046)***	(0.562)*	(1.204)	(0.683)
GE	0.001	-0.005	0.006	-0.243	-0.494	-0.123
	(0.002)	(0.003)*	(0.002)***	(0.109)**	(0.240)**	(0.155)
RQ	0.002	0.003	0.003	-0.042	-0.175	-0.080
	(0.002)	(0.002)	(0.002)	(0.082)	(0.205)	(0.120)
RL	0.001	0.005	-0.003	0.012	0.068	-0.082
	(0.002)	(0.003)**	(0.003)	(0.067)	(0.159)	(0.115)
CC	-0.002	-0.001	-0.003	0.222	0.456	0.250
	(0.002)	(0.002)	(0.002)	(0.091)**	(0.228)*	(0.133)*
Large Dummy	-0.394	-0.360	-0.518	-2.330	-7.613	-0.875
	(0.047)***	(0.062)***	(0.063)***	(1.874)	(4.872)	(2.114)
Year Dummy	0.038			0.016		
	(0.017)**			(0.698)		
Large*Year Dummy	-0.096			0.139		
	(0.024)***			(0.731)		
Large*GE	0.003	0.001	0.005	0.289	0.555	0.148
	(0.003)	(0.004)	(0.004)	(0.110)**	(0.242)**	(0.156)
Large*RQ	-0.000	0.000	-0.001	0.021	0.146	0.068
	(0.002)	(0.003)	(0.003)	(0.084)	(0.208)	(0.122)
Large*RL	-0.003	-0.002	-0.004	-0.061	-0.128	0.041
	(0.003)	(0.004)	(0.004)	(0.072)	(0.162)	(0.117)
Large*CC	0.001	0.001	0.003	-0.202	-0.437	-0.227
	(0.002)	(0.003)	(0.003)	(0.092)**	(0.228)*	(0.133)*
Constant	-1.487	-1.815	-0.748	2.167	4.791	0.564
	(0.326)***	(0.479)***	(0.448)*	(5.399)	(10.570)	(6.973)
R^2	0.87	0.86	0.89	0.49	0.52	0.52
N	513	256	257	123	51	72

* $p<0.1$; ** $p<0.05$; *** $p<0.01$; standard errors are in parentheses

Appendix C

Summary Statistics

Below is a table with a summary of the descriptive statistics for the variables used in the empirical analysis. These summary statistics are for the pooled 2002 and 2008 data. The three dependent variables, identified in the first three rows of the table, are classified, as in the regressions, by the groups SME enterprises or large enterprises.

Variable	Obs.	Mean	Std. Dev.	Min	Max	Unit
Value of exports (grouped by enterprise size)	894	858.78	10826.01	0.00	196746.50	Millions $
Number of enterprises (grouped by enterprise size)	894	219.95	1678.51	0.00	36242.00	Enterprise
Average value of exports (grouped by enterprise size)	894	1.05	7.72	0.00	162.87	Millions $
GDP of destination	730	256565.00	1070143.00	31.00	14300000.00	Millions $
GDP per capita of destination	724	9676.50	15688.37	0.00	118908.60	$
Remoteness	894	6697.74	3504.59	0.00	13243.36	Km
Distance between economic centers	894	8923.83	3374.50	1485.64	16547.92	Km
Voice and Accountability (normalized)	786	49.50	18.21	10.35	78.78	Index
Political Stability and Absence of Violence (normalized)	770	49.14	17.82	1.07	80.26	Index
Government Effectiveness (normalized)	780	49.67	18.04	8.98	93.78	Index
Regulatory Quality (normalized)	780	49.67	18.07	8.05	85.98	Index
Rule of Law (normalized)	788	49.54	17.99	14.62	85.95	Index
Control of Corruption (normalized)	780	49.76	18.18	16.72	94.87	Index