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### Abstract

We set out in this study to examine the effects of country 'corporate social responsibility' (CSR) ratings on the international trade flows of 28 countries. Drawing on categorization theory, we examine whether country CSR engagement is a categorizing factor capable of influencing the overall process of categorization. Based upon a two-stage approach, comprising of gravity and panel Tobit models, we find that a country's CSR rating has significantly positive effects on the country's international trade flows. When the CSR rating of a country is higher than that of another rival trading country, this will have significantly positive effects on the bilateral trade flows between the two countries. Our results are consistent with country-of-origin theory and halo effect.

**Keywords** Trade flows; Corporate social responsibility; Gravity model; Panel Tobit model.

**Taxonomy** Applied Economics, Empirical Economic Research

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## Submission Files Included in this PDF

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Dear Editor,

I am pleased to resubmit a manuscript, entitled “Can Country Trade Flows Benefit from Improved Corporate Social Responsibility Ratings?” co-authored with Shou-Lin Yang, Ariana Chang and Yen-Hsun Chen for consideration by your journal.

If you have any enquiries about this manuscript, please let me know. Thank you very much for your time and look forward to hearing from you.

Best regards

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# Can Country Trade Flows Benefit from Improved Corporate Social Responsibility Ratings?

Manuscript ID (ECMODE\_2017\_1549\_R1)

## Responses to Reviewer 2 Comments

We are extremely grateful to the Editor and the Reviewer for the insightful and valuable comments and suggestions provided on the earlier version of our manuscript. We have done our best to ensure that all of the constructive suggestions have been taken on board, and believe that the latest revision of the paper has been significantly improved as a result of the changes that have now been made.

The specific point-by-point revisions made in response to the suggestions provided by Reviewer 2 are outlined below.

### Reviewer's Comments and Responses

- 1. I think the authors have made remarkable progress with this revision, but in my opinion the paper is still not able to be accepted.*

*Thus, in particular, i would like to see a theoretical framework of support, which has not happened yet. Moreover, the results should be better placed in the literature.*

#### Response

We greatly appreciate this important observation, and as a result, we have now strengthened the theoretical framework of our paper and compared our results with prior studies in the revised version of the paper. To be more specific, we draw on categorization theory, country-of-origin theory and halo effect to explain why a country's CSR rating has significantly positive effects on the country's international trade flows. Moreover, we include more previous studies (e.g., Hsu, 2006; Albornoz, Cole, Elliott and Ercolani, 2014; Diestre and

Rajagopalan, 2014; Shiu and Yang, 2017; Newman, Rand, Tarp and Trifkovic, 2018) in the revised paper not only to construct our arguments but also to which compare and contrast our results with (please refer to pp. 1, 4, 8-12, 21-22 and 24 of the revised version of our paper).

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## Highlights

- A country's CSR rating has significantly positive effects on the country's international trade flows.
- When the CSR rating of a country is higher than that of another rival trading country, this will have significantly positive effects on the bilateral trade flows between the two countries.
- Improving the CSR ratings of a country's domestic firms is a worthwhile endeavour for the national government.

# Can Country Trade Flows Benefit from Improved Corporate Social Responsibility Ratings?

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# Can Country Trade Flows Benefit from Improved Corporate Social Responsibility Ratings?

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## ABSTRACT

We set out in this study to examine the effects of country ‘corporate social responsibility’ (CSR) ratings on the international trade flows of 28 countries. Drawing on categorization theory, we examine whether country CSR engagement is a categorizing factor capable of influencing the overall process of categorization. Based upon a two-stage approach, comprising of gravity and panel Tobit models, we find that a country’s CSR rating has significantly positive effects on the country’s international trade flows. When the CSR rating of a country is higher than that of another rival trading country, this will have significantly positive effects on the bilateral trade flows between the two countries.

**Keywords:** Trade flows; Corporate social responsibility; Gravity model; Panel Tobit model.

**JEL Classification:** M14; C23; F14

## 1. INTRODUCTION

There is continuing interest in the country-of-origin effect on international trade; *ceteris paribus*, consumers in other countries are likely to have a preference for commodities from the exporting country as a result of the country-of-origin effect, thereby affecting the country's trade flows. Theoretically, this country-of-origin effect arises from the halo or cascading effect, based upon which the national image of a commodity exporting country can, to some extent, substitute the commodity image. This substitution can then change the preferences of consumers in other countries for the commodities from the exporting countries.

The recognition of countries of origin by consumers has approached some connection with product specialty, and thus, affects their perceptions, attitudes and purchase intentions towards products (Roth and Romeo, 1992; Samiee, 1994). With consideration of the country-of-origin effect, although many consumers may never directly purchase or use products from a specific country, they may establish some valuation on the source country's products or make a decision on whether or not to consume such products, based only on the image or recognition of the country of origin.

The country-of-origin effect may also directly influence sales of the country's products, specifically in terms of trading conditions between two countries. For example, common perceptions may be that France and Italy produce high-quality



products, whilst Chinese products have an image of being cheaper with indifferent quality; thus, the images formed of these countries will affect consumer preferences and purchasing behavior, thereby further affecting product sales and mutual trade between various countries.

The country-of-origin image that consumers have of any given country is a crucial factor in the purchasing decisions made by such consumers with regard to other countries' products (Fournier, 1998; Verlegh and Steenkamp, 1999). This is because a country's image may create a 'halo effect' amongst consumers in other countries, which directly influences their attitude towards the products.<sup>1</sup> According to the theory of 'good management', a higher 'corporate social responsibility' (CSR) rating for an enterprise can result in a more positive evaluation of various other aspects of the enterprise amongst stakeholders;<sup>2</sup> and indeed, from certain viewpoints, this can also be seen as a halo effect. If the halo effect concept is applied to consumer perceptions of countries of origin, then a better CSR rating should lead to a better country image, with consumers consequently having a more positive attitude towards such countries when making their purchasing decisions. Thus, the products of such countries of origin will

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<sup>1</sup> The 'halo effect' refers to the cognitive judgement of people or goods, whereby the judgements generated from overall impressions transfer to subsequent judgements on the quality of other objects (Bilkey and Nes, 1982)

<sup>2</sup> The theory of 'good management' (Schuler and Gording, 2006) argues that enterprises with good social behavior can be expected to experience better business performance. Once stakeholders are aware of this, they will reward these companies through consumption, investment, employment and other approaches.

enjoy improved trade flows and trade outcomes when their domestic enterprises exhibit superior CSR performance.

The prior research in this field focuses essentially on the factors affecting the country-of-origin image, with the formation of consumer reasoning being discussed in terms of the representative products of the country of origin, its national features, economic and political background, history and tradition.<sup>3</sup> However, most of the current CSR research tends to focus on enterprise-level issues, thereby clearly indicating that CSR at country level is rarely addressed.

In this study, we build on country-of-origin theory to identify the causal mechanisms that explain why a country's CSR ratings will influence its international trade. The primary aim of the present study is therefore to contribute to the current gap in the extant literature by investigating the effects of the CSR ratings of domestic enterprises on a country's trade flows, with our analysis being based upon a dataset of 28 sample countries. Our research reveals that the absolute CSR ratings of a country's domestic firms are positively related to its international trade flows. When the absolute CSR rating of a country's domestic enterprises is higher than that of another rival trading country, this will have significantly positive effects on the bilateral trade flows between the two countries.

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<sup>3</sup> See, for example, Nagashima (1970), Lantz and Loeb (1996) and Fournier (1998).

The empirical results of our study may prove to be a useful case study reference for use by relevant government authorities, since those enterprises that increase their investment in social responsibility are not only found to improve their corporate financial performance (Christmann, 2000; McWilliams and Siegel, 2001), but also benefit their trade at the national level; that is, in addition to maintaining product quality and price competitiveness, enhancing overall CSR performance at enterprise level can greatly improve national trade flows.

## 2. BACKGROUND AND HYPOTHESIS DEVELOPMENT

### 2.1 Country-of-origin and Halo Effects

We define the ‘country of origin’ as the association between a country and a particular product or service, whilst the ‘country-of-origin effect’ refers to consumer perceptions of products in relation to their country of origin. Consumers make certain connections between the recognition of a product’s country of origin and its features, which will directly influence both the evaluation of the product and the purchasing decisions made by such consumers (Roth and Romeo, 1992; Samiee, 1994).

The country-of-origin effect had been extensively studied ever since the seminal work of Schooler (1965), who proposed that when faced with two homogeneous products, a customer’s purchasing decision will be influenced not only by the country of origin, but also by their relative preference or aversion to products based upon this

preconception. The country-of-origin effect is the resultant impact on consumers arising mainly from the halo effect, a phenomenon belonging to the field of psychology, initially proposed by Thorndike (1920) and confirmed by subsequent experiments in image formation by Asch (1946) and Kelley (1950).

In short, when a person with limited information on an item sets out to make a judgement, cognitive bias may occur; this is the 'halo effect'. Therefore, it is clearly a personal and subjective generalization, which can lead to people making distorted assessments of the item. When a person links the item with a perceived positive impression, then the item is seemingly surrounded by a positive halo, which endows it with good qualities; conversely, when the item is linked to a perceived bad impression, this will devalue the assessment of the item. Thus, when a consumer is unfamiliar with a product from a specific country, it is likely that they will be influenced by the halo effect and will try to infer the qualities of the product based upon their perception of its country of origin. This inference will produce beliefs in the product, thereby determining a general attitude towards the product.

Numerous prior studies have confirmed that country image has significant influences on consumer decision-making;<sup>4</sup> this is essentially because the halo effect may come into play when consumers are unfamiliar with a product from a specific country

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<sup>4</sup> Examples include Parameswaran and Pisharodi (1994), Pecotich and Ward (2007) and Wang, Li, Barnes and Ahn (2012.)

of origin. Consumers may start to infer the characteristics or properties of the product based upon nothing more than its country of origin, with the final attitude towards the product ultimately being formed by the perceived country image. We therefore consider it important to explore the factors creating the country image and inducing the subsequent halo effect.

The image that a person has of a country is a generalized concept which forms their attitude towards a particular country, essentially a form of preconception or stereotyping.<sup>5</sup> In some of the earlier related studies, country image was seen as being constituted by the national characteristics of the country, including its typical products, economics, politics, history and culture.<sup>6</sup>

A number of other studies have since gone on to summarize the main factors affecting country image, such as economic development (Cordell, 1992; Agrawal and Kamakura, 1999), workmanship and culture (Agrawal and Kamakura, 1999) and labour standards,<sup>7</sup> with many of these studies confirming that these factors can directly affect consumer spending decisions relating to foreign products. However, more recent relevant research has reported that consumers are now beginning to pay much greater attention to CSR practices (Carrigan and Attalla, 2001),<sup>8</sup> and indeed, there is

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<sup>5</sup> See Johansson and Thorelli (1985), Han (1989), Roth and Romeo (1992) and Samiee (1994).

<sup>6</sup> See, for example, Nagashima (1970), Parameswaran and Pisharodi (1994), Lantz and Loeb (1996) and Fournier (1998).

<sup>7</sup> See Roth and Romeo (1992), Agrawal and Kamakura (1999) and Verlegh and Steenkamp (1999).

<sup>8</sup> The concept of CSR, which was first proposed by Bowen (1953), can be described as spontaneous

increasing recognition of CSR performance gradually starting to affect consumer decision making;<sup>9</sup> thus, CSR performance has become an important evaluation factor, particularly in international marketing (Saran and Gupta, 2012).

## **2.2 Country CSR Ratings and International Trade**

According to categorization theory, an organization's audience will use criteria to categorize firms in order to cope with ambiguity, uncertainty and complexity (Diestre and Rajagopalan, 2014). The process of categorization is invoked to help audience to evaluate a firm more easily and faster. In the present study, we focus on the effects arising from a country's CSR performance on its international trade; thus, consumers are the primary audience in our research.<sup>10</sup>

In this research, we propose that a country's CSR performance plays an important role as a categorizing factor capable of influencing the overall process of categorization. Based on country-of-origin theory, firms of a country would benefit from the country's overall CSR performance. Consumers may not be familiar with a particular foreign firm and its firm-level CSR performance. With limited information

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and unprompted improvement in the social behaviour of enterprises (McWilliams and Siegel, 2000; Mackey, Mackey and Barney, 2007), with many empirical studies having subsequently confirmed the relationships between CSR and business performance; for example, CSR improvement has been found to change stakeholder attitudes towards enterprises (Kanter and Brinkerhoff, 1981; Scott, 1995), improve corporate reputation (Orlitzky, Schmidt and Rynes, 2003) and lead to the accumulation of moral capital. See, for example, Godfrey (2005), Peloza (2006) and Godfrey, Merrill and Hansen (2009).

<sup>9</sup> Examples include Creyer and Ross (1997), McWilliams and Siegel (2001) and Shiu and Yang (2017).

<sup>10</sup> The term 'audience' in categorization theory refers to a firm's stakeholders which evaluate the firm. Stakeholders include customers, suppliers, investors and employees (Hsu, 2006).

on the firm, they would make a judgement about the firm based on its country-of-origin in accordance with halo effect. If the country which the firm reside in has a good country CSR performance, consumers would make an initial assessment of the firm and categorize it as a CSR firm unless it is found to act in socially irresponsible ways. This is referred to as halo effect, which is a kind of habitual tendency or cognitive bias in which consumers' overall impression of a country's CSR performance influences how consumers feel and think about the firms within that country.

As is well established in the literature, consumers may prove to be more willing to accept higher product prices as a direct result of CSR improvements (Creyer and Ross, 1997), thereby differentiating the products from those of other enterprises (McWilliams and Siegel, 2001) and providing enterprises with improved returns,<sup>11</sup> whilst also inducing other consumers to buy the products (Smith and Alcorn, 1991). At firm level, higher CSR will provide customers with a degree of beneficial association, thereby affecting their attitudes and decision-making (Shiu and Yang, 2017), whilst at country level, the higher overall CSR ratings of a country will also change consumers' attitudes for the better towards their products, thereby increasing the trade flows of the country. Newman, Rand, Tarp and Trifkovic (2018) document a positive relation

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<sup>11</sup> See Brown and Dacin (1997), Creyer and Ross (1997) and Sen and Bhattacharya (2001).

between firms' social performance and their participation in global markets.

Collectively, these arguments lead to our single hypothesis in this study:

**Hypothesis:** *A country's trade flow can be increased by improving its CSR at domestic enterprise level.*

### 3. METHODOLOGY AND MODEL CONSTRUCTION

#### 3.1 Gravity Model

Our primary aim is to determine whether improvements in the CSR ratings of a country's domestic enterprises can have positive effects on the country's trade flows.

Our analysis involves an empirical model modified from a 'gravity' model, derived from Newton's Law in physics.<sup>12</sup> Timbergen (1962) first proposed a concept similar to the law of gravity for use in analysing trade flows between countries which differed from the traditional trade flow analysis in international trade theory.<sup>13</sup> This concept was subsequently applied in a number of studies through the establishment of a simple econometric model used to estimate trade relations between the two countries.<sup>14</sup>

The method sets the trade flow between two countries as a dependent variable, with the national incomes of the two countries and the 'transportation distance' being

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<sup>12</sup> Newton's 'Law of Gravity' posits that a particle will attract every other particle using a force that is positively proportional to the product of their masses and negatively proportional to the square of the distance between them.

<sup>13</sup> Deardorff (1984) noted that at that time, the mainstream trade flow analysis in international trade theory was based upon the theory of factor endowments.

<sup>14</sup> Examples include Poyhonen (1963), Pulliainen (1963) and Timbergen (1964).



set as the independent variables. The trade flow between two countries has been found to be positively proportional to the product of the two countries' national incomes (Madura, 2012), whereas it is inversely proportional to the transportation distance, and since this estimation formula is similar to the law of gravity, it has been described as a gravity equation.

The gravity model has since come into increasing use in studies on empirical trade flows, and indeed, the model has achieved high explanatory power in many of the related studies. Linneman (1966), for example, extended the gravity equations to include population as an independent variable, whilst Aitken (1973) adopted the model to explore the effects of the European Economic Community (EEC) and the European Free Trade Association (EFTA) on trade in European countries. Leamer (1974) went on to apply the gravity model to the exploration of manufactured products in international trade flows.

However, given the lack of any theoretical basis, the gravity model has failed to achieve full recognition and acceptance by international trade researchers; hence, a number of scholars began to construct a theoretical foundation for the model. Anderson (1979) and Bergstrand (1985; 1989) used a utility maximization approach to derive their gravity model, and indeed, it was found that the model coincided with the 'utility maximization' hypothesis. Feenstra (1998) and Feenstra, Markusen and Rose

(2001) subsequently integrated the gravity equations to confirm the various trade theories. Other studies have since contributed to the strengthening of the theoretical basis of the gravity model,<sup>15</sup> with scholars having greatly expanded upon the models and their empirical applications.

Improvements in the CSR ratings of a country's domestic enterprises should theoretically encourage consumers to change their attitudes and preferences towards the country's products as a result of the halo effect, which would then have a positive impact on the country's trade flows. Due to increasingly successful validations in the various related empirical studies, the gravity model has gone on to become the mainstream model for discussions on trade flows. We therefore adopt the gravity model as the basic framework for our investigation in the present study of the effects of the CSR ratings of a country's domestic enterprises on trade flows.

### **3.2 Empirical Model Construction**

The original gravity model, developed by Tinbergen (1962), was based upon economic output levels, the average national income and the geographical location (transportation distance) of both countries as the means of explaining the trade flow relationship, as shown in Equation (1):

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<sup>15</sup> Examples include Helpman and Krugman (1985), Deardorff (1998), Baier and Bergstrand (2001), Eaton and Kortum (2002) and Anderson and van Wincoop (2003).

$$\log VOT_{ij}^t = \alpha_0 + \alpha_1 \log(GDP_i^t \times GDP_j^t) + \alpha_2 \log(PCGNP_i^t \times PCGNP_j^t) + \alpha_3 DIST_{ij} + \varepsilon_{i,j}, \quad (1)$$

where  $VOT_{ij}^t$  is the trade value between country  $i$  and country  $j$  in year  $t$ ;  $GDP_i^t$  ( $GDP_j^t$ ) refers to the GDP of country  $i$  ( $j$ ) in year  $t$ ;  $PCGNP_i^t$  ( $PCGNP_j^t$ ) denotes the per-capita gross national product of country  $i$  ( $j$ ) in year  $t$ ;<sup>16</sup>  $DIST_{ij}$  represents the transportation distance between country  $i$  and country  $j$ ; and  $\varepsilon_{i,j}$  is the error term.

Trade value has been assessed in the prior related studies using a diverse range of variables, including export value (Aitken, 1973), import value (Sanso, Cuairan and Sanz (1993) and the total value of bilateral trade (Frankel, Stein and Wei, 1995). Following the initial introduction and development of the gravity model,<sup>17</sup> Linnemann (1966) subsequently went on to add other factors into the model, such as language, culture and region leading to what has emerged as the gravity model in general use today, as shown in Equation (2):

$$\log VOT_{ij}^t = \beta_0 + \beta_1 \log(GDP_i^t \times GDP_j^t) + \beta_2 \log(PCGNP_i^t \times PCGNP_j^t) + \beta_3 DIST_{ij} + \sum_k \mu_k OTH_{ij}^k + \varepsilon_{i,j} \quad (2)$$

When comparing Equation (1) with Equation (2), we can see that the latter has an additional item,  $OTH_{ij}^k$ , which represents the potential existence of  $k$  contiguity

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<sup>16</sup> Although per-capita national income was originally taken into the gravity model, considering the influence of national purchasing power on trade flows, we follow the World Bank practice in the present study to replace per-capita national income by per-capita gross national product.

<sup>17</sup> Refer to Timbergen (1962), Poyhonen (1963) and Pulliainen (1963).

variables in countries  $i$  and  $j$ . Such contiguity refers to various other factors, with the notable exceptions of the economic sizes of the two countries, transportation distance and national income, factors on which the traditional gravity model places particular focus (Linnemann, 1966). These contiguity variables may give rise to a border effect (Bergstrand, 1985; McCallum, 1995) which may heighten or weaken the influence of the original variables, such as the economic size and national income of the two countries, as well as the transportation distance between them.<sup>18</sup>

However, the primary influence on trade flows attributable to the CSR ratings of the domestic enterprises of a country is actually the change in the attitudes and cognition of the country's products by consumers in other countries stemming from the halo effect. According to economic theory, the CSR ratings of a country's domestic enterprises can change the product preferences of consumers in other countries, thereby giving rise to the border effect (Head and Mayer, 2000). Therefore, when constructing our model on the effects of the CSR ratings of domestic enterprises on trade flows, we must also consider the impact of border effects.

We use the gravity model shown in Equation (2) with the inclusion of the CSR

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<sup>18</sup> Following the finding of Bergstrand (1985) that adjacent territories could produce a border effect, subsequent scholars went on to identify various other factors that may give rise to a border effect; examples include tariff or non-tariff barriers to trade (McCallum, 1995), national policies and specific consumer preferences (Head and Mayer, 2000), the existence of industry monopolies (Bergstrand, 1989), language (Soloaga and Winters, 2000) and whether or not the country was located in the same integrated area of the regional economy (Soloaga and Winters, 2000). Therefore, the border effect is not simply a consideration relating to common territory between two countries.

variables, along with various cross-multiplication terms and other variables, to reflect the possible border effect, as shown in Equation (3):

$$\begin{aligned}
\log VOT_{ij}^t = & \gamma_0 + \gamma_1 \log(GDP_i^t \times GDP_j^t) + \gamma_2 \log(PCGNP_i^t \times PCGNP_j^t) + \gamma_3 DIST_{ij} \\
& + \gamma_4 CSR_i^t + \gamma_5 RCSR_{ij}^t + \gamma_6 (CSR_i^t \times \log(GDP_i^t \times GDP_j^t)) \\
& + \gamma_7 (CSR_i^t \times \log(PCGNP_i^t \times PCGNP_j^t)) + \gamma_8 (CSR_i^t \times DIST_{ij}) \\
& + \gamma_9 (RCSR_{ij}^t \times \log(GDP_i^t \times GDP_j^t)) + \gamma_{10} (RCSR_{ij}^t \times \log(PCGNP_i^t \times PCGNP_j^t)) \\
& + \gamma_{11} (RCSR_{ij}^t \times DIST_{ij}) + \varepsilon_{i,j}
\end{aligned} \tag{3}$$

where  $CSR_i^t$  is the overall CSR rating of country  $i$  in year  $t$ ;  $RCSR_{ij}^t$  represents the CSR ratings of the relative domestic enterprises and is proxied by the difference between the CSR ratings of the domestic enterprises of country  $i$  and the rival country  $j$  in year  $t$ . The  $RCSR_{ij}^t$  formula is expressed as:

$$RCSR_{ij}^t = CSR_i^t - CSR_j^t \tag{4}$$

In addition to the  $CSR_i^t$  and  $RCSR_{ij}^t$  variables, a number of other variables first proposed by Timbergen (1962) and Linnemann (1966) are also included within this model; these are GDP, per-capita national income and the transportation distance between the two countries. In order to observe whether  $CSR_i^t$  and  $RCSR_{ij}^t$  have border effects on the other variables, the cross-multiplication terms,  $CSR_i^t$  and  $RCSR_{ij}^t$ , are also added to the other variables in the model.

### 3.3 Serial Correlation and Heteroskedasticity

Finally, the estimation equation on the effects of the CSR ratings of the country's

domestic enterprises on its trade flows, which changes from that in the original

Equation (3), is now expressed as:

$$\begin{aligned}
\log VOT_{ij}^t = & \gamma_0 + \gamma_1 \log(GDP_i^t \times GDP_j^t) + \gamma_2 \log(PCGNP_i^t \times PCGNP_j^t) + \gamma_3 DIST_{ij} \\
& + \gamma_4 \hat{CSR}_i^t + \gamma_5 DC\hat{SR}_{ij}^t + \gamma_6 (\hat{CSR}_i^t \times \log(GDP_i^t \times GDP_j^t)) \\
& + \gamma_7 (\hat{CSR}_i^t \times \log(PCGNP_i^t \times PCGNP_j^t)) + \gamma_8 (\hat{CSR}_i^t \times DIST_{ij}) \\
& + \gamma_9 (RC\hat{SR}_{ij}^t \times \log(GDP_i^t \times GDP_j^t)) + \gamma_{10} (RC\hat{SR}_{ij}^t \times \log(NCGNP_i^t \times PCGNP_j^t)) \\
& + \gamma_{11} (RC\hat{SR}_{ij}^t \times DIST_{ij}) + \varepsilon_{i,j}
\end{aligned} \tag{5}$$

When considering both the CSR ratings of a country's domestic enterprises and its trade flows, the two variables will be affected by other factors in that year, and indeed, they may also be related to their lagged data. Pooled or panel data have both time-series and cross-sectional data properties; therefore, given that the ordinary least squares (OLS) approach assumes that the intercepts of all of the samples are the same, such an assumption ignores the existence of potential differences between them. As a result, any studies obtaining estimates directly through the use of the OLS approach may introduce some degree of bias.

If we were to simply use time-series or cross-sectional analyses to carry out our estimations, it is possible that problems of serial correlation and/or heteroscedasticity may be introduced into our results; furthermore, our analysis also becomes potentially problematic if it does not consider differences between the samples. If the estimators are still found to have unbiased and consistent features but are not fully effective, then as noted by Hsiao (1986), this will not represent the 'best linear unbiased estimate'

(BLUE); thus, the use of a panel-data model may be more appropriate for our estimations when the sample has panel data characteristics.

In accordance with the assumptions of the intercept term, the model is divided into fixed-effects and random-effects models. The fixed-effects model has additional dummy variables representing the region- and time-specific fixed effects on the intercept term.<sup>19</sup> The random-effects model assumes that a random sample is selected from a population and that the sample differences are caused by the random sampling process; in contrast, the fixed-effects model assumes that differences already exist in the sample. Although both the random- and fixed-effects models express the region- and time-specific fixed effects on the intercept term, the random-effects model includes an additional unobservable random error term.

In order to determine whether we should adopt either a least squares approach or a fixed-effect model, we use the F-test to determine whether or not the intercept term of the model is equal; if the term is found to be unequal, then the least squares approach should not be used (Hsiao, 1986). We then go on to use the Lagrange multiplier (LM) test to determine whether we should adopt either an OLS approach or

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<sup>19</sup> With controls in place for other explanatory variables, the region-specific fixed effect indicates that each region causes the fixed effect on the dependent variable within the region as a result of its regional specialty and time-invariance, whereas the time-specific fixed effect will not exhibit any regional difference. Each specific time period (each year, in our case) has its own fixed effects which can be used to explain the variations in the dependent variable that are not explained by the control variables included in the model.

a random-effects model by checking whether the intercept term has a stochastic property (Breusch and Pagan, 1980); if it does have such a property, then the least squares approach is unsuitable for our analysis.

If both the F-test and LM test indicate that the OLS approach should not be used, then we must adopt the test introduced by Hausman (1978) to reaffirm whether the fixed-effects or random-effects model should be used. If the results of the Hausman test reveal that the independent variables are related to the error term of the intercept, then the fixed-effects model should be adopted; otherwise, we should use the random-effects model.

#### 4. DATA AND VARIABLES

The data on the average CSR performance values for each country used in this study were obtained from the ASSET4 database, whilst the export, import and total trade values for each country were obtained from the Direction of Trade Statistics (DOTS) database of the International Monetary Fund (IMF). The macroeconomic data on all of the countries were obtained from the IMF's International Financial Statistics (IFS), the Financial Structure and Economic Development Database (FSEDD), the World Development Index (WDI) and the World Bank Atlas (WBA). Since Taiwanese data are not included in the IMF or WDI databases, all of the Taiwan-related economic and trade data were collected from the AREMOS database.



The ASSET4 database is one of only a few databases containing country CSR ratings. Since a country CSR rating is the average of CSR ratings of domestic firms within that country, there are some concerns with regard to the significant differences in the number of each country's CSR-rated enterprises included in the database, and indeed, it is suggested that those countries with very few rated enterprises are probably not representative of the country as a whole. We therefore decided to exclude all countries from our sample which had less than 100 CSR-rated enterprises; this resulted in our final sample comprising of a total of 28 different countries, each with 100 or more CSR-rated domestic enterprises.<sup>20</sup>

The designations, definitions and data sources of the variables used in this study are shown in Table 1. Our sample period covers the years 2009 to 2016, essentially because the ASSET4 data base began collecting data in 2009. The Spearman correlations, means and standard deviations are reported in Table 2.

<Tables 1 and 2 are inserted about here>

## 5. EMPIRICAL RESULTS

### 5.1 Model Construction

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<sup>20</sup> The 28 countries examined in our research are South Africa, China, Hong Kong, Japan, South Korea, Taiwan, Denmark, France, Germany, Italy, Netherlands, Norway, Russian Federation, Spain, Sweden, Switzerland, United Kingdom, Israel, Canada, Mexico, USA, Australia, Brazil, India, Indonesia, Malaysia, Singapore and Thailand. Of these, South Africa, China, Mexico, Brazil, India, Indonesia, Malaysia, Thailand are developing countries, while the others are developed countries. The countries are listed and ranked in the Appendix in accordance with their CSR ratings in 2016.

We used the F-test, LM test and Hausman test to describe the trade flows that are partly affected by the CSR ratings of the country's domestic enterprises, with the results being reported in Table 3. Given that the results of the F-test and LM tests are found to reject the null hypothesis, it is clear that the OLS approach should not be used. The rejection of the null hypothesis by the Hausman test also indicates that the independent variables are related to the error term of the intercept, which clearly highlights the need to adopt a fixed-effects model for our estimations. Based upon the results of these tests, our second-stage estimations are carried out using a fixed-effects model.

<Table 3 is inserted about here>

## **5.2 Empirical Analysis**

### **5.2.1 Analysis of the results on all sample countries**

Equation (7) is used to estimate the influence of the CSR ratings of a country's domestic enterprises on its national trade flows. The results on all 28 sample countries are shown in Table 4, where Models (1) and (2), which are the respective value of exports and total trade volume (the sum of export and import values), are used as the dependent variables.

<Table 4 is inserted about here>

As we can see from Table 4, the important variables in both Models (1) and (2) of the traditional gravity model, such as the GDP levels of the two countries, per-capita

national income and the transportation distance between the two countries, are all found to have significant effects. This essentially confirms that the larger the scale economies of the two countries, the stronger the potential for public consumption. Similarly, the lower the transportation costs, the higher the trade flows between the two countries. The two primary variables of greatest concern in the present study are the absolute and relative CSR ratings of the domestic enterprises, and indeed, these are both found to have positive and significant effects on trade flows between the two countries.

Our findings are consistent with the view of Saran and Gupta (2012) that CSR activities have become a valuable international marketing tool for improving national and corporate brands (Torres, Bijmolt, Tribó and Verhoef, 2012). Our results also highlight an increase in trade flows with both absolute and relative CSR ratings. When a country's domestic enterprises exhibit good social performance, or their CSR ratings are found to be superior to the ratings of the domestic firms of the rival trading countries, manufacturers or consumers within the rival trading countries will be more willing to purchase products or services from that country, thereby leading to further increases in the country's trade flows. This evidence is also consistent with Kitzmueller and Shimshack (2012) who find that demand-side pressure for CSR engagement mainly come from customers, who tend to purchase goods or services from firms that act socially responsible. Similarly, the pressure could also come from

suppliers, who may have a tendency to require their customers to engage in CSR activities (Albornoz, Cole, Elliott and Ercolani, 2014). Both demand and supply sides of pressure for CSR initiatives increase CSR engagement, which would then increase international trade.

We now turn to the question of whether the CSR performance of domestic enterprises results in a border effect. Observations on the two variables representing the CSR performance of a country's domestic enterprises and the cross-multiplication terms with the other variables indicate that, regardless of whether the export value or total trade volume is set as the dependent variable, all of the cross-multiplication terms are found to be significant at conventional levels. In particular, the coefficients on the cross-multiplication terms between  $\hat{CSR}_i^t$  and the other variables are found to be significant at least at the 5 per cent level; this indicates that trade flows will have a significant border effect if a country's domestic enterprises exhibit superior CSR performance or have better CSR ratings than those of other rival trading countries.

Furthermore, the cross-multiplication terms between the CSR ratings of the domestic enterprises and the GDP and average per-capita national income levels of the two countries are found to be positively related to trade flows, whereas the coefficient on the cross-multiplication terms between the CSR ratings of the domestic enterprises and the transportation distance between the two countries are found to have a negative

relationship. According to Cohen, Cohen, West and Aiken (2003), a country with domestic enterprises which exhibit good CSR performance – or performance which is superior to that of the enterprises in other rival trading countries – will experience an enhanced effect on both GDP and per-capita national income between the two countries, but a buffering effect on the transportation distance.

In order to confirm the robustness of our results, we apply one-period lagged data and then re-estimate the models. The results, which are reported in Table 5, reveal that, regardless of whether export value or total trade volume is used as the dependent variable, our findings remain similar to those reported in Table 4, with only slight differences in the coefficients and significance levels.

<Table 5 is inserted about here>

### 5.2.2 Analysis of the results on developing and developed countries

We divide the sample countries into ‘developed’ and ‘developing’ countries and construct four regression types comprising of ‘from developed to developed’, ‘from developed to developing’, ‘from developing to developed’ and ‘from developing to developing’. This facilitates the estimation of the influence of the CSR of a country’s domestic businesses on trade flows with its rival trading country, with the export value and the total trade amount being similarly set as separate dependent variables. The results are shown in Tables 6-1 to 6-4.

<Tables 6-1 to 6-4 are inserted about here>

The results shown in these four tables reveal that, regardless of whether the rival trading country is a developed or developing country, if the product exporting country is a developed country, then the higher that country's CSR rating score, the greater the influence on the export value and total trading volume. The results reveal a significantly positive correlation, with the coefficient on 'from developed to developing' being slightly larger than that on 'from developed to developed'. If the product exporting country is a developing country, then we still find that the country's CSR rating score has significantly positive effects on both the export value and total trading volume. However, as regards rival trading countries, there are clear differences between the developed and developing countries; both the coefficients and significance of 'from developing to developed' are found to be larger than those of 'from developing to developing'. This finding is consistent with Newman et al. (2018) who find that Vietnamese exporters to United States are more involved in CSR activities than those to China.

As for the interaction terms with the other variables, the four regression types reveal only minor differences, with all of the positive relationships having significance at the 5% to 10% levels. This indicates that, regardless of whether it is a developed or developing country, better CSR performance in that country can strengthen the effects

caused by GDP and average national income in the partner countries, with a buffering effect existing against the influence of transportation distance.

The RCSR is the difference between the CSR evaluations in the two countries. As shown in Tables 6-1 and 6-2, regardless of whether the counterparty is a developed or developing country, if the commodity exporting countries are already developed countries, then the RCSR has a positive correlation with both export value and total trading volume, with significance at the 10% level. However, if the exporting country is a developing country, then the impact of RCSR is not found to be significant.

As regards the interaction terms with the other variables, if the exporter is a developing country, then the interaction terms between RCSR and GDP or national per-capita income of the two countries have positive effects at the 10% significance level; however, the interaction term between RCSR and transportation distance is not found to be significant. This indicates that RCSR slightly enhances the influence of the GDP and national per-capita income variables. Conversely, if the commodity exporting country is a developing country, then the coefficients on the interaction terms between RCSR and the other variables are not found to be significant.

As a check for the robustness of the results shown in Tables 6-1 to 6-4, we apply a one-lag period to each explanatory variable and then carry out our estimations again. The results for the four regression types, which are shown in Tables 7-1 to 7-4, are found

to be approximately the same as those reported in the original Tables 6-1 to 6-4, thereby indicating that our analysis results are stable.

<Tables 7-1 to 7-4 are inserted about here>

## 6. DISCUSSION AND CONCLUSIONS

In this study, we make use of an analytical model derived from the gravity model in order to provide confirmation of the notion that trade flows are proportional to the product of the national income variables of two countries and inversely proportional to the square of the transportation distance. We also show that if a country's domestic companies have higher absolute corporate social responsibility (CSR) ratings, then this will indeed affect the attitudes and preferences of consumers in other countries for the commodities of that country as a result of the 'halo' effect, a phenomenon which will help to increase bilateral trade flows.

However, when examined from a developed or developing country perspective, if the commodity exporting country is a developed country, regardless of whether the rival trading country is a developed or developing country, the higher the national CSR score, the greater the export value and total trading volume. Similarly, when the exporting country is a developing country and the rival trading country is a developed country, then the higher the national CSR score, the greater the export value and total trade. However, when the rival trading country is a developing country, the effect is



found to be relatively low.

Differences in the CSR ratings between the two countries will also have impacts on their export value and total trading volume. If the absolute CSR valuation of a country (rated by its domestic businesses) is higher than that of its rival trading country, then this can lead to an increase in bilateral trade flows; however, this effect is much more pronounced when the commodity exporting country is a developed country, and not so obvious when the commodity exporting country is still going through the various stages of development.

These results indicate that if a country's domestic enterprises can place greater focus on socially-responsible activities and increase their level of investment in social responsibility, then, in addition to enhancing the country's image, they will also improve trading activity in their country of origin.

According to Kitzmueller and Shimshack (2012), CSR activities represent a type of responsible behaviour which can effectively internalize an enterprise's external costs; however, in theory, an enterprise which seeks to internalize its external costs will also tend to reduce its overall level of production. Hence, when faced with policy decisions aimed at urging domestic enterprises to engage in more socially-responsible activities, a government will often find itself caught up in a dilemma between social responsibility and economic development (Yang, Wu and Lee, 2015).

Nevertheless, the results of the present study may provide governments with strong incentives to continue encouraging enterprises to improve their social responsibility. Although enterprises are clearly going to be devoted to pursuing profit maximization (Friedman, 1970), at the same time, they also understand that increasing CSR activities is beneficial to sales among consumers in other countries. With more opportunities to trade across borders come increased responsibilities for governments to further responsible business practices and for private firms to act socially responsible.

The extant literature relating to corporate social responsibility focuses mainly on enterprise-level issues, such as the effect of CSR activities on a firm's economic performance, with little research, if any, focusing on the effects of CSR on a country's macroeconomic factors or overall trade. Our focus in the present study is on an examination of a total sample of 4,303 domestic enterprises in 28 selected countries to determine the influence of CSR ratings on bilateral trade flows at national level. Our results reveal that with improvements in the CSR performance of a country's domestic enterprises, there is a halo effect among consumers which directly affects their preferences and attitudes towards the country's products.

In terms of promoting trading with other countries, superior CSR ratings can clearly help to further increase a country's bilateral trade flows, whilst also giving rise

to a border effect, which not only strengthens the influences on GDP and per-capita national income, but also weakens the impact of transportation distance on trade flows. This further demonstrates that consumers will tend to change their attitudes or preferences towards a country's products when that country is recognised as having superior CSR performance levels.

Finally, as regards the limitations of our research, in order to enhance the representativeness of the CSR ratings of the sample countries, we selected a total of 28 countries, each of which had more than 100 domestic companies with CSR ratings. Under the specific constraint of sample country data, we could not avoid the simplification of our research model, and as a result, we were unable to take into consideration certain factors, such as culture, language and industrial structure. If updated and more complete information becomes available in the future, then it may prove very interesting to pursue further advanced research in this direction.

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Table 1 Variable definitions and reference sources

Variables	Code	Definition	Sources
Value of trade	$VOT_{ij}^t$	The total trade volume (sum of exports and imports) between country $i$ and its trade rival country $j$ in year $t$ .	DOTS, AREMOS
Export value	$EV_{ij}^t$	The export value from country $i$ to its trade rival country $j$ in year $t$ .	DOTS, AREMOS
Country CSR rating	$CSR_i^t$	The CSR rating of country $i$ in year $t$ .	ASSET4
Relative country CSR ranking	$RCSR_{ij}^t$	The difference in CSR ratings between country $i$ and its rival country $j$ in year $t$ .	ASSET4
GDP of two countries	$GDP_i^t \times GDP_j^t$	Nominal GDP of country $i$ and the trade rival country $j$ in year $t$ , representing their respective economic scales. The greater the economic scale, the greater the value of trade between the two countries.	IFS, AREMOS
Per-capita GNP of two countries	$PCGNP_i^t \times PCGNP_j^t$	Per-capita GNP of country $i$ and the trade rival country $j$ in year $t$ , representing the respective income levels of the two countries. The greater the income level, the stronger the demand and supply and the greater the economic scale, which is positively related to the trade value between the two countries.	FSEED, AREMOS
Distance	$DIST_{ij}$	Transport distance between country $i$ and the trade rival country $j$ , collected from data on the distance of the main trading ports by sea transportation in WBA. Distance represents the transport cost for the trade between the two countries; the further the distance, the higher the transport costs, which is negatively related to the trade value between the two countries.	WBA

Table 2 Spearman correlations, means and standard deviations

Variables	$VOT_{ij}^t$		$EV_{ij}^t$		$CSR_i^t$		$RCSR_{ij}^t$		$GDP_i^t \times GDP_j^t$		$PCGNP_i^t \times PCGNP_j^t$		$DIST_{ij}$	
	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.
$EV_{ij}^t$	1.41	5.24***												
$CSR_i^t$	1.09	3.76***	1.86	2.98***										
$RCSR_{ij}^t$	0.71	2.20**	0.93	3.71***	0.54	1.40								
$GDP_i^t \times GDP_j^t$	0.20	4.11***	0.31	5.80***	0.06	0.92	0.02	0.80						
$PCGNP_i^t \times PCGNP_j^t$	0.81	4.14***	1.16	3.29***	0.40	1.04	0.18	0.91	1.52	1.35				
$DIST_{ij}$	-2.97	-5.21***	-3.28	-6.82***	1.19	0.64	0.68	0.82	2.11	0.75	3.01	0.87		
Mean	18.66		11.87		52.63		2.02		68.40		77.92		28.34	
S.D.	4.71		3.89		3.65		0.81		17.84		13.41		11.90	

Note: \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 3 F-test, LM test and Hausman test results

F-test	LM test	Hausman test
32.42***	251.32***	15.86***

Note: \*\*\* indicates significance at the 1% level

Table 4 CSR performance impact of domestic companies on trade flows

Variables	EV <sup>a</sup>		VOT <sup>a</sup>	
	Coeff. <sup>b</sup>	S.E.	Coeff. <sup>b</sup>	S.E.
Constant	1.379**	0.541	1.691**	0.650
$\ln(GDP_i^t \times GDP_j^t)$	0.059*	0.033	0.094**	0.035
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.044**	0.019	0.062**	0.027
$DIST_{ij}$	0.277*	0.124	0.459*	0.205
$CSR_i^t$	0.726*	0.343	0.911*	0.455
$RCSR_{ij}^t$	0.084	0.055	0.108	0.062
$CSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.042	0.026	0.051*	0.029
$CSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.096*	0.056	0.165	0.097
$CSR_i^t \times DIST_{ij}$	0.336***	0.079	0.437***	0.136
$RCSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.126***	0.036	0.160***	0.049
$RCSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	-2.601***	0.743	-3.232***	1.156
$RCSR_i^t \times DIST_{ij}$	24.188***	3.564	44.011***	4.475
F-value	743.245***		652.430***	
Adj. R <sup>2</sup>	0.515		0.507	

Notes:

<sup>a</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .

<sup>b</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.



Table 5 Robustness check: Regression results using one-period lagged data

Variables	EV <sup>a</sup>		VOT <sup>a</sup>	
	Coeff. <sup>b</sup>	S.E.	Coeff. <sup>b</sup>	S.E.
Constant	1.323**	0.497	1.657**	0.663
$\ln(GDP_i^t \times GDP_j^t)$	0.061**	0.027	0.096**	0.038
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.046**	0.020	0.064*	0.031
$DIST_{ij}$	0.268*	0.127	0.441*	0.197
$CSR_i^t$	0.708*	0.345	0.898*	0.445
$RCSR_{ij}^t$	0.081	0.052	0.105	0.064
$CSR_i^t \ln(GDP_i^t \times GDP_j^t)$	0.043	0.025	0.052*	0.031
$CSR_i^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.098	0.060	0.166	0.096
$CSR_i^t \times DIST_{ij}$	0.332***	0.094	0.435***	0.135
$RCSR_i^t \ln(GDP_i^t \times GDP_j^t)$	0.127***	0.034	0.161***	0.050
$RCSR_i^t \ln(PCGNP_i^t \times PCGNP_j^t)$	-2.595***	0.737	-3.237***	1.153
$RCSR_i^t \times DIST_{ij}$	23.350***	3.826	42.866***	4.653
F-value	693.131***		614.491***	
Adj. $R^2$	0.494		0.476	

Notes:

<sup>a</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .

<sup>b</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 6-1 CSR performance impact of domestic companies on trade flows (from developed to developed)

Variables	EV <sup>a</sup>		VOT <sup>a</sup>	
	Coeff. <sup>b</sup>	S.E.	Coeff. <sup>b</sup>	S.E.
$CSR_i^t$	1.256**	0.435	1.616**	0.629
$CSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.042**	0.019	0.068***	0.022
$CSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.035**	0.012	0.052**	0.020
$CSR_i^t \times DIST_{ij}$	0.279**	0.112	0.457**	0.161
$RCSR_{ij}^t$	0.679**	0.231	0.884**	0.356
$RCSR_{ij}^t \times \ln(GDP_i^t \times GDP_j^t)$	0.075*	0.038	0.098*	0.051
$RCSR_{ij}^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.029*	0.014	0.038*	0.019
$RCSR_{ij}^t \times DIST_{ij}$	0.089*	0.051	0.162*	0.083
$\ln(GDP_i^t \times GDP_j^t)$	0.378***	0.104	0.469***	0.146
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.106***	0.028	0.142***	0.044
$DIST_{ij}$	-2.781***	0.690	-3.365***	1.115
Constant	29.502***	4.421	55.810***	5.133
F-value	623.18***		588.45***	
Adj. $R^2$	0.503		0.492	

Notes:

<sup>a</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .

<sup>b</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 6-2 CSR performance impact of domestic companies on trade flows (from developed to developing)

Variables	EV <sup>a</sup>		VOT <sup>a</sup>	
	Coeff. <sup>b</sup>	S.E.	Coeff. <sup>b</sup>	S.E.
$CSR_i^t$	1.377**	0.582	1.593**	0.686
$CSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.059**	0.024	0.079**	0.031
$CSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.041**	0.018	0.058**	0.026
$CSR_i^t \times DIST_{ij}$	0.230*	0.126	0.396*	0.204
$RCSR_{ij}^t$	0.840*	0.441	0.976*	0.529
$RCSR_{ij}^t \times \ln(GDP_i^t \times GDP_j^t)$	0.089*	0.048	0.105*	0.054
$RCSR_{ij}^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.035*	0.019	0.043*	0.022
$RCSR_{ij}^t \times DIST_{ij}$	0.093	0.065	0.184	0.116
$\ln(GDP_i^t \times GDP_j^t)$	0.267***	0.085	0.412***	0.127
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.135***	0.034	0.163***	0.052
$DIST_{ij}$	-2.113**	0.826	-2.765**	1.337
Constant	17.874***	3.441	36.835***	4.280
F-value	369.358***		348.231***	
Adj. $R^2$	0.610		0.522	

Notes:

<sup>a</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .

<sup>b</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 6-3 CSR performance impact of domestic companies on trade flows (from developing to developed)

Variables	EV <sup>a</sup>		VOT <sup>a</sup>	
	Coeff. <sup>b</sup>	S.E.	Coeff. <sup>b</sup>	S.E.
$CSR_i^t$	1.869***	0.610	2.108***	0.684
$CSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.076**	0.028	0.122**	0.035
$CSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.047**	0.022	0.060**	0.027
$CSR_i^t \times DIST_{ij}$	0.315*	0.168	0.530**	0.242
$RCSR_{ij}^t$	0.831	0.564	0.974	0.607
$RCSR_{ij}^t \times \ln(GDP_i^t \times GDP_j^t)$	0.091	0.065	0.119	0.078
$RCSR_{ij}^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.063	0.042	0.069	0.045
$RCSR_{ij}^t \times DIST_{ij}$	0.096	0.058	0.141	0.089
$\ln(GDP_i^t \times GDP_j^t)$	0.314***	0.093	0.404***	0.129
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.116***	0.033	0.131***	0.041
$DIST_{ij}$	-2.420***	0.715	-3.180***	1.048
Constant	23.447***	4.110	33.118***	4.965
F-value	251.74***		248.51***	
Adj. $R^2$	0.374		0.362	

Notes:

- <sup>a</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .
- <sup>b</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 6-4 CSR performance impact of domestic companies on trade flows (from developing to developing)

Variables	EV <sup>a</sup>		VOT <sup>a</sup>	
	Coeff. <sup>b</sup>	S.E.	Coeff. <sup>b</sup>	S.E.
$CSR_i^t$	0.798*	0.404	1.264*	0.650
$CSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.130	0.073	0.229	0.136
$CSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.108	0.062	0.144	0.097
$CSR_i^t \times DIST_{ij}$	0.288	0.181	0.439	0.263
$RCSR_{ij}^t$	0.461	0.323	0.712	0.469
$RCSR_{ij}^t \times \ln(GDP_i^t \times GDP_j^t)$	0.106	0.078	0.150	0.096
$RCSR_{ij}^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.089	0.057	0.105	0.079
$RCSR_{ij}^t \times DIST_{ij}$	0.145	0.086	0.197	0.122
$\ln(GDP_i^t \times GDP_j^t)$	0.291***	0.081	0.373***	0.110
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.266***	0.068	0.354***	0.097
$DIST_{ij}$	-3.260***	0.809	-3.772***	1.203
Constant	8.235***	2.350	14.949***	2.885
F-value	153.642***		144.934***	
Adj. $R^2$	0.271		0.282	

Notes:

- <sup>a</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .
- <sup>b</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 7-1 Robustness check: CSR performance impact of domestic companies on trade flows (from developed to developed)<sup>a</sup>

Variables	EV <sup>b</sup>		VOT <sup>b</sup>	
	Coeff. <sup>c</sup>	S.E.	Coeff. <sup>c</sup>	S.E.
$CSR_i^t$	1.214**	0.447	1.590**	0.669
$CSR_i^t \ln(GDP_i^t \times GDP_j^t)$	0.044*	0.019	0.070**	0.024
$CSR_i^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.036**	0.013	0.054**	0.023
$CSR_i^t \times DIST_{ij}$	0.271**	0.109	0.446**	0.158
$RCSR_{ij}^t$	0.658**	0.229	0.857**	0.352
$RCSR_{ij}^t \ln(GDP_i^t \times GDP_j^t)$	0.069*	0.036	0.091*	0.049
$RCSR_{ij}^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.030*	0.015	0.039**	0.020
$RCSR_{ij}^t \times DIST_{ij}$	0.094*	0.053	0.164*	0.085
$\ln(GDP_i^t \times GDP_j^t)$	0.371***	0.098	0.462***	0.143
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.105***	0.027	0.140***	0.043
$DIST_{ij}$	-2.790***	0.694	-3.377***	1.121
Constant	28.338***	4.220	53.942***	5.072
F-value	612.59***		577.54***	
Adj. $R^2$	0.489		0.471	

Notes:

- <sup>a</sup> We apply one-period lagged data to confirm the robustness both the models.
- <sup>b</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .
- <sup>c</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 7-2 Robustness check: CSR performance impact of domestic companies on trade flows (from developed to developing)<sup>a</sup>

Variables	EV <sup>b</sup>		VOT <sup>b</sup>	
	Coeff. <sup>c</sup>	S.E.	Coeff. <sup>c</sup>	S.E.
$CSR_i^t$	1.351**	0.565	1.578**	0.673
$CSR_i^t \ln(GDP_i^t \times GDP_j^t)$	0.061*	0.026	0.080*	0.034
$CSR_i^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.043*	0.019	0.059*	0.028
$CSR_i^t \times DIST_{ij}$	0.223*	0.120	0.384*	0.197
$RCSR_{ij}^t$	0.826*	0.435	0.959*	0.510
$RCSR_{ij}^t \ln(GDP_i^t \times GDP_j^t)$	0.090	0.059	0.109	0.070
$RCSR_{ij}^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.039*	0.021	0.046*	0.024
$RCSR_{ij}^t \times DIST_{ij}$	0.095	0.068	0.187	0.121
$\ln(GDP_i^t \times GDP_j^t)$	0.264***	0.083	0.407***	0.125
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.141***	0.037	0.168***	0.055
$DIST_{ij}$	-2.196**	0.831	-2.810**	1.350
Constant	17.185***	3.218	36.349***	4.161
F-value	358.403***		343.185***	
Adj. $R^2$	0.604		0.517	

Notes:

- <sup>a</sup> We apply one-period lagged data to confirm the robustness both the models.
- <sup>b</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .
- <sup>c</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

Table 7-3 Robustness check: CSR performance impact of domestic companies on trade flows (from developing to developed)<sup>a</sup>

Variables	EV <sup>b</sup>		VOT <sup>b</sup>	
	Coeff. <sup>c</sup>	S.E.	Coeff. <sup>c</sup>	S.E.
$CSR_i^t$	1.765***	0.602	2.052***	0.661
$CSR_i^t \ln(GDP_i^t \times GDP_j^t)$	0.077**	0.029	0.124**	0.039
$CSR_i^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.049**	0.022	0.062**	0.028
$CSR_i^t \times DIST_{ij}$	0.304*	0.161	0.519*	0.257
$RCSR_{ij}^t$	0.799	0.541	0.956	0.594
$RCSR_i^t \ln(GDP_i^t \times GDP_j^t)$	0.092	0.070	0.122	0.082
$RCSR_i^t \ln(PCGNP_i^t \times PCGNP_j^t)$	0.065	0.044	0.072	0.049
$RCSR_i^t \times DIST_{ij}$	0.095	0.061	0.140	0.090
$\ln(GDP_i^t \times GDP_j^t)$	0.320***	0.097	0.411***	0.134
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.119***	0.034	0.134***	0.043
$DIST_{ij}$	-2.265***	0.697	-3.084***	0.993
Constant	22.878***	4.003	32.704***	4.795
F-value	245.120***		241.614***	
Adj. $R^2$	0.371		0.355	

Notes:

- <sup>a</sup> We apply one-period lagged data to confirm the robustness both the models.
- <sup>b</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .
- <sup>c</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.



Table 7-4 Robustness check: CSR performance impact of domestic companies on trade flows (from developing to developing)<sup>a</sup>

Variables	EV <sup>b</sup>		VOT <sup>b</sup>	
	Coeff. <sup>c</sup>	S.E.	Coeff. <sup>c</sup>	S.E.
$CSR_i^t$	0.706*	0.388	1.187*	0.663
$CSR_i^t \times \ln(GDP_i^t \times GDP_j^t)$	0.134	0.078	0.236	0.142
$CSR_i^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.110	0.065	0.149	0.098
$CSR_i^t \times DIST_{ij}$	0.267	0.170	0.418	0.252
$RCSR_{ij}^t$	0.445	0.310	0.683	0.455
$RCSR_{ij}^t \times \ln(GDP_i^t \times GDP_j^t)$	0.098	0.073	0.144	0.093
$RCSR_{ij}^t \times \ln(PCGNP_i^t \times PCGNP_j^t)$	0.084	0.055	0.101	0.077
$RCSR_{ij}^t \times DIST_{ij}$	0.138	0.084	0.186	0.116
$\ln(GDP_i^t \times GDP_j^t)$	0.303***	0.092	0.398***	0.126
$\ln(PCGNP_i^t \times PCGNP_j^t)$	0.261***	0.064	0.349***	0.095
$DIST_{ij}$	-3.342***	0.907	-3.900***	1.269
Constant	8.149***	2.327	14.781***	2.748
F-value	152.589***		143.928***	
Adj. $R^2$	0.267		0.280	

Notes:

- <sup>a</sup> We apply one-period lagged data to confirm the robustness both the models.
- <sup>b</sup> EV is the export value from country  $i$  to its trade rival country  $j$  in year  $t$ , and VOT is the total trade volume (sum of exports and imports) between country  $i$  and its trade rival country  $j$  in year  $t$ .
- <sup>c</sup> \* indicates significance at the 10% level; \*\* indicates significance at the 5% level; and \*\*\* indicates significance at the 1% level.

## APPENDIX

*Table A-1 Sample Countries and their CSR Ratings in 2016*

Region	Countries	Companies	CSR Rating in 2016
Europe	Norway	110	58
Europe	Spain	275	57
South Asia	India	385	56
Europe	France	422	55
Europe	Italy	177	55
Europe	Netherlands	161	55
Middle East	Israel	109	55
Europe	Denmark	140	54
Europe	Germany	333	54
Africa	South Africa	319	54
South Asia	Thailand	100	54
Asia	South Korea	475	53
Europe	United Kingdom	1173	53
South America	Brazil	279	53
South Asia	Indonesia	130	53
South Asia	Malaysia	235	53
Europe	Russian Federation	124	52
Europe	Switzerland	257	52
North America	Mexico	107	52
Asia	China	691	51
Asia	Taiwan	292	51
Asia	Hong Kong	234	50
South Asia	Singapore	181	49
North America	USA	6866	48
Pacific	Australia	678	47
Asia	Japan	955	46
North America	Canada	655	46