Working Paper Series

#2019-046

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Gideon Ndubuisi and Maty Konte

Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)
email: **info@merit.unu.edu** | website: **http://www.merit.unu.edu**

Boschstraat 24, 6211 AX Maastricht, The Netherlands
Tel: (31) (43) 388 44 00

UNU-MERIT Working Papers
ISSN 1871-9872

Maastricht Economic and social Research Institute on Innovation and Technology
UNU-MERIT

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Credit Constraints and Trade Performance: Does Trust-Based Social Capital Matter?

Gideon Ndubuisi[1]
UNU-MERIT/Maastricht University

Maty Konte[2]
UNU-MERIT/Maastricht University

Abstract

It has been extensively argued that trust-based social capital expands access to credit. We embed this argument in the "credit-constrained literature," which documents inter-sector differences in financial vulnerability. We argue that financially constrained sectors are relatively better off in countries with a higher social trust level. Employing bilateral trade data comprising 50 countries' exports in 27 sectors during 1996–2008, we find that countries with a higher social trust level export more in financially vulnerable sectors because they export more products to each destination (extensive margin) and sell more of each product (intensive margin), which is in line with our hypothesis. With the exception of the intensive margin, these results are robust to a battery of sensitivity checks, including controlling for formal financing.

Keywords: *Social Trust; Trade; Trade Margins; Credit Constraints*
JEL: *F10; F14; D70*

[1] ndubuisi@merit.unu.edu
[2] konte@merit.unu.edu

1. Introduction

Following Guiso et al. (2009), there has been an upsurge of empirical research on the effects of trust on international trade. This literature focuses predominantly on bilateral trust; however, it uses cross-country data on European countries where bilateral-trust data exist (Guiso et al., 2009; Yu et al., 2015; Spring & Grossmann, 2016; Melitz & Toubal, 2019). This literature builds on the argument that international trade is characterised by huge transaction costs and asymmetric information. Because contracts are hardly complete, and because monitoring and enforcing them is difficult, especially in international trade, where non-face-to-face interactions are the dominant form of exchange, bilateral trust between implied parties becomes a panacea toward engendering international trade (Spring & Grossmann, 2016; Ngyyen & Bernauer, 2018). In this paper, we focus on social trust. We use a large sample of developed and developing countries to analyse how a high social trust level, resulting from easing access to external credit, leads to relatively better export performance, especially in financially vulnerable sectors.

The conventional wisdom in economics and social sciences at large is that trust engenders economic exchange (Arrow, 1972; Guiso *et al*., 2004). One of the ways trust enhances economic exchange is through access to credit. Guiso *et al*. (2004) notes that credit contracts are trust-intensive contracts since credit is an exchange of money today for a promise to return more money in the future. And such an exchange depends both on the legal enforceability of contracts and the extent to which the credit lender trusts the borrower. The mechanism by which social trust affects access to credit is at least twofold.

Firstly, high social trust level facilitates firms' access to informal financing channels such as trade credit (Wu *et al.,* 2014; Levine *et al.,* 2018; Hassan & Habib, 2019). Secondly, high social trust level expands access to formal financing channels by reducing moral hazards and adverse selection problems which make raising external capital difficult and expensive for firms. For instance, through peer monitoring and social pressure which are seen as more effective ways of achieving compliance (Arnott & Stiglitz, 1991), high social trust level can mitigate moral hazards thereby increasing access to more external finance (Karlan, 2005; Cason *et al.,* 2012). High social trust level also lowers the probability of firms committing financial frauds, hence investors and credit lenders perceive financial reports of firms in trust-intensive regions to be

more credible. This lowers adverse selection and increases the willingness of credit lenders to extend credits to firms in such regions. Jha (2019), for instance, empirically found that firms headquartered in high trusting regions in the US have a lower probability of committing fraud by misrepresenting financial information, while Chen *et al.* (2016) found that privately controlled firms in trust-intensive regions in China are more likely to obtain loans.

The importance of firms' access to credit for international trade is well documented in the literature: unlike domestic producers, exporting is well associated with additional upfront fixed cost, and huge variable costs which make them more reliant on external finance (Amiti & Weinstein, 2011; Manova, 2013; Manova *et al.,* 2015). This literature also suggests that whilst all exporters face huge exporting costs, differences in firm-specific credit constraints lead to heterogeneous export responses at the sector level to macroeconomic changes. Manova (2013), for instance, provides theoretical and empirical evidences suggesting that financially developed economies export relatively more in more financially vulnerable sectors.[3] Underpinning her work as well as those of others in the literature is the assumption that while developed financial intermediaries and markets benefit firms through greater access to credit to ease enormous costs associated with exporting, this applies more forcefully in more financially vulnerable sectors and the marginal effects are also stronger in those sectors given the greater efficiency of capital allocation.

Similarly, we argue that financially vulnerable sectors should experience a relative better export performances in high trusting societies because high social trust level also expands access to external credit which firms can also use to ease enormous costs associated with exporting. Consequently, in this paper, we identify the impact of social trust on export by exploring cross country variations in social trust together with sector variation in financially vulnerability. While social trust level may not always affect export in a significant way, our identification assumption is that they matter decisively in a positive way for financially vulnerable sectors. Therefore, we evaluate the export effect of social trust using the empirical approach developed by Rajan & Zingales (1998) and recently adopted in the literature on credit constraint and international trade (Amiti & Weinstein, 2011; Manova, 2013; Crino & Ogliari, 2017; Manova *et al.,* 2015). The

[3] That is, sectors that require more outside capital and are with few conventional collateralisable assets.

approach allows a flexible framework to test our hypothesis by examining how the interaction of country-specific indicator of social trust and sector-specific indicator of financial vulnerability affects export.

Our empirical analysis comprises the bilateral trade data of 50 countries' exports in 27 industries to 50 importing countries during the period of 1996–2008. We measure social trust using the World Value Survey trust indicator. The variable is measured as the proportion of a country's population that "agrees" with the statement, "Most people can be trusted." We proxy sector financial vulnerability with the external-finance-dependence index originally computed by Rajan and Zingale (1998). This index is measured as the share of capital expenditures not financed with cash flows. We also test the robustness of our results by employing other sectors' financial-vulnerability indicators used in literature.

Our baseline results show that countries with high social trust level export relatively more in those sectors that depend more on external finance. This result is robust to a number of robustness checks including alternative econometric specification, econometric techniques, and proxies of sector financial vulnerability, among others. We also decompose exports into the extensive and intensive margins and evaluate the effect of social trust on both margins in order to underpin how social trust affects exports.

Our decomposition method follows Hummels & Klenow (2005), but we adapt their method by constructing the export margins at the industry level whilst they constructed theirs at the country level. Accordingly, the extensive export margin is measured as the number of products exported in sector from a country, and the intensive export margin as the value of each product exported in a sector from a country. The empirical results on the export margins are largely consistent with those of the overall total export, suggesting that the differential effect of social trust on exports in financially vulnerable sectors works along the extensive and intensive margins. However, we only find the results on the differential effect of social trust on the extensive margins to be robust to battery of sensitivity tests we subject the results to. Our results lead to the general conclusion that high social trust level leads to an improvement in a country's export performances by easing

firms access to external credit with which they can use to meet the enormous cost associated with exporting.

Our paper provides new insight into the emerging literature on the trade effect of trust, which has so far focused predominantly on bilateral trust. Specifically, unlike existing studies that focus on the "transaction cost reducing effect of trust," we add to the literature by focusing on the "credit expanding effect of trust" by assessing the impact of trust on trade. Importantly, we perform our analysis using social trust, which represents a paradigm shift from the conventional approach of using bilateral trust. We do so because the most obvious way bilateral trust expands access to credit is through letters of credit. This is different from social trust, which has an overarching effect on all manner of formal and informal financing, letters of credit inclusive. In addition, bilateral trust is largely determined by social trust because, when citizens do not trust one another, it is more unlikely that others would trust them. Roy et al. (2014) also analysed the impact of social trust on trade. Their study evaluates how social trust, as an informal institution, affects trade by facilitating access to informal financing, particularly in financially underdeveloped economies. The researchers tested a country's social-trust indicator against a dummy variable to determine whether the country is financially developed. Our study complements their paper but differs in four important ways.

First, rather than focusing on a dichotomised cross-country differences in financial development level, we combine cross-country differences in the levels of social trust together with inter-sector differences in financial vulnerability to identify the effect of social trust on trade. On the one hand, this approach provides persuasive evidence on the credit channel as it directly measures the differential response of sectors at various levels of credit constraints to changes in the national levels of social trusts. On the other hand and as argued elsewhere (see Rajan & Zingales, 1998; Chen, 2017), our empirical approach provides compelling evidence on the trade effect of trust as it is less prone to endogeneity issues. In this way, we synthesis the recently-emerging "trade and trust literature" (Roy *et al*., 2014; Yu *et al*., 2015; Spring & Grossmann, 2016; Xing & Zhou, 2018; Melitz & Toubal, 2019) with the "trade and credit constrained literature" (Amiti & Weinstein, 2011; Manova, 2013; Manova *et al*., 2015; Crino & Ogliari, 2017). Our study therefore provide empirical evidence on the export performances of financially constrained

sectors even in financially underdeveloped economies due to possible substitution and complementarity between formal and informal financing channels which are made manifest by trust based social capital. Secondly, unlike in Roy *et al.* (2014), we evaluate the impact of social trust on the extensive and intensive export margins. Third, we subject our gravity model to battery of sensitivity tests to account for recent developments in the gravity model literature. In these ways, our study provides a more comprehensive and systematic analysis on the trade effect of social trust.

The remainder of the paper is structured as follows. Section 2 presents the data sources and model specification. Section 3 presents the empirical results. Section 4 concludes.

2. Data and Model Specification

This section discusses the variables and their data sources, and the empirical model that are used in the analysis.

2.1. Social Trust

To measure social trust, we rely on the trust variable from the World Value Survey which covers a number of developed and developing countries. These data present at least two desirable features. First, this data has been extensively used in the literature evaluating different economic outcomes (Zak & Knack, 2001; Bottazi *et al*., 2016; Levine *et al.,* 2018). Second, the validity of the data in capturing cross-country variations in social trust level has been validated, among others, by Knack and Keefer (1997) which found that survey-based measure of trust is positively associated with the number of wallets that were lost and subsequently returned with their contents intact in an experiment conducted in both USA and various countries in Europe.

The trust variable is measured as the proportion of a population that "agrees" with the statement, "Most people can be trusted". We directly extract this variable from the CANA Dataset (Castellacci & Natera, 2011) for a sample comprising 50 countries between the periods of 1996-2008.[4] Table 1A in the appendix lists the countries in our sample. The sample values range from

[4] Castellacci and Natera (2011) use imputation methods to fill-in missing observations for different countries. We kindly refer the reader to the article for more detailed description about the data.

a low of 2.8 percent in Brazil in 1997 to a high of 74 percent in France in 2008. The mean value is 0.295 with a standard deviation of 0.146. Countries at the 75th percentile have a score value of 0.393 while those at the 25th percentile have a score value of 0.186.

2.2. Sectors' Financial Vulnerability

A common practice in the "credit-constrained literature" that considers inter-sector differences in financial vulnerability is to use industrial data on all publicly listed US firm to construct measures of sector financial vulnerability as a proxy of credit constraints at the sector level (Rajan & Zingales, 1998; Manova, 2013; Crino & Ogliari, 2017). As emphasised in this literature, using US as the reference country is convenient due to limited cross-country comparable data and because it ensures that the measures are not endogenous to macroeconomic variables of interests such as social trust. This method provides a universal ranking of sectors' financial vulnerability which is independent of a country-sector specific financial vulnerability. Furthermore, because the US financial market is well-developed, using US data as the benchmark ensures that the indicators are more reflective of firms' optimal choice over external financing and asset structure in each sector (Rajan & Zingales, 1998; Manova, 2013; Crino & Ogliari, 2017).

We follow this approach by using an indicator of sectors' external finance dependence as our main measure of financial vulnerability at the sector level. The index was originally computed by Rajan & Zingale (1998) to proxy firms' dependence on outside capital for long-term investment. It is computed as the average share of capital expenditures not financed with cash flows from operations. As robustness checks we further use three other indicators that have been used in the literature to measure financial vulnerability at the sector level. They include Asset tangibility, Liquidity needs, and R&D intensity. We take these variables from Manova *et al*. (2015). "Asset tangibility" is computed as the median share of net fixed assets in total book-value assets. Because this variable increases with sector asset tangibility, we multiply the index by -1 so that higher values can be interpreted easily as higher asset intangibility. "R&D intensity" is computed as the share of R&D spending in total sales. "Liquidity needs" is computed as the ratio of inventories to sales to proxy firms' dependence on outside capital for short-term working capital.

These variables are constant over time and vary only across sectors. Table 2A lists the sectors in our sample together with their financial vulnerability indicators.

2.3. Trade Indicators

We source original export data from the BACI-CEPII database. We extract data for a sample of 50 countries at the 6-digit Harmonised System Classification (HSC) for which there are corresponding explanatory variables over the sample period. We then use a concordance table to map the 6-digit HSC products into the 3-digit International System Industry Classification Revision (ISIC Rev.).[5] From this, we derive three outcome indicators including total industry export, and the industry extensive and intensive export margins. To compute the overall total export and also decompose it alongside the extensive and intensive margins, we adapt Hummels and Klenow (2005) decomposition method to account for the sector dimension in our data. The overall total export (Tot_{isjt}) is thus given as:

$$Tot_{isjt} = \frac{\sum_{n \in N_{isjt}} p_{isjt} q_{isjt}}{\sum_{n \in N_{wsjt}} p_{wsjt} q_{wsjt}} \qquad (1)$$

n is a HSC product category exported by country i from sector s to j in period t. N_{wsjt} is a complete set of products in sector s that the world exports to j in period t while N_{isjt} is a subset of N_{sjt} containing only those products that i has positive export to j in period t. $p_{sijt}q_{sijt}$ is the respective value for each i's export to j in period t while $p_{swjt}q_{wjts}$ ($=\sum p_{sijt}q_{sijt}$) is the respective value for each w's export to j in period t. Next, the extensive margin is defined as a weighted count of product categories exported by i from sector s to j, where each product category are weighted by their relative importance in w's export to j. If each product category has an equal importance, the extensive margin is then the fraction of products that i's exports from sector s to j. In particular, the extensive margin (Ext_{isjt}) is defined as:

$$Ext_{isjt} = \frac{\sum_{n \in N_{isjt}} p_{wsjt} q_{wsjt}}{\sum_{n \in N_{wsjt}} p_{wsjt} q_{wsjt}} \qquad (2)$$

[5] https://wits.worldbank.org/product_concordance.html

The extensive margin increases with the number of products that *i* exports to *j* ($n \in N_{isjt}$) relative to that of the *w*'s exports ($n \in N_{wsjt}$). Next, the intensive margin is the export value of *i* to *j* relative to the *w*'s export value in those product categories where *i* has positive export values to *j*. In particular, the intensive margin is defined as:

$$Int_{isjt} = \frac{\sum_{n \in N_{isjt}} p_{isjt} q_{isjt}}{\sum_{n \in N_{isjt}} p_{wsjt} q_{wsjt}} \qquad (3)$$

Finally, it could be shown that:

$$lnTot_{isjt} = ln(Ext_{isjt}) + ln(Int_{isjt}) \quad (4)$$

Equation (4) is an important result and suggests that the construction of both margins follow a linear decomposition such that if both margins are in logs, any linear operator such as OLS should give estimates which when summed will add-up to the corresponding estimate for total exports. This allows us to quantify the importance of the extensive and intensive margins on the relationship between social trust and credit-constrained sector exports.

2.4. Empirical Model

To empirically evaluate our hypothesis that exports from more financially vulnerable sectors will be relatively better off in countries with higher levels of social trust we interact the indicator of sectors' indicator of financial vulnerability with the variable social trust level. This approach builds on the seminal work of Rajan & Zingales (1998) that interacted sectors' indicator of external finance dependence with a national indicator of financial development to study the impact of financial development on the output growth of credit constrained sectors. Instead of focusing on financial development, we look at the impact of social trust on exports in financially constrained sectors. The baseline equation that guides our analysis is given as follows:

$$X_{ijst} = \varphi T_{it} F v_s + \alpha T_{it} + \sum_{k=1}^{n} (\psi_k Z^k) + \delta_i + \delta_j + \delta_s + \delta_t + \pi_{ijst} \qquad (5)$$

X_{ijst} is either one of the three outcome variables defined above. We use each outcome variable in a separate regression while estimating equation (5). T_{it} is the social trust level of country i at time t. Fv_s is the sector's financial vulnerability indicator. We exclude the individual effect of Fv_s from equation (5) as it is already subsumed in the sector fixed effects. φ is the coefficient of interest as it shows the relative response of exports in financially vulnerable sectors to changes in social trust level. We thus expect φ to be positive in all cases.

Z^k is the K^{th} control variable while n is the number of control variables. We include in our gravity model conventional gravity variables such as exporter and importer gross domestic products (GDP) and bilateral trade cost variables such as: bilateral distances ($\ln DIST$), common border ($Border$), and Common language ($COMLAN$). With the exception of Distance which is measured in kilometers per distance, the other bilateral trade costs variables are dummies which take the value of one if the country-pairs are common in those dimensions and zero otherwise. The gravity model variables all come from the BACI-CEPII database. δ_t is year effects. δ_i, δ_j and δ_s are exporter, importer, and sector fixed effects which account for both the panel unobserved heterogeneity and Multilateral Resistance Terms. Finally, π_{ijst} is the idiosyncratic error term. We use the OLS method for the estimations. Table 3A in the appendix presents the correlation matrix of the variables used in the analysis.

3. Empirical Results

This section proceeds in four sub-sections. The first presents the baseline regression results while the second presents the robustness checks.

<< Insert Table 1>>

3.1. Baseline Regression

Table 1 displays the baseline regression results where we control for social trusts and our preferred measure of financial vulnerability, external finance dependence. Each column in the Table contains a full set of unreported exporter, importer, sector, and time fixed effects. Also, the standard error for each column in the table is clustered at the country-pair level. The overall fit of each regression is quite reasonable as the estimated R-squared is around 0.72 and above. Column

1 reports the result for the total export. The estimated coefficient on $T_{it}Fv_s$ is positive and statistically significant at all conventional level. This suggests that countries with high social trust level export relatively more in sectors that depends more on external finance.

In terms of economic importance, the result suggest that a one standard deviation expansion in the social trust level will increase total export by 0.899 percentage point for an industry at the average external finance dependence (0.324). To provide further context, when we consider the cross country variations in social trust level in the sample, the result further suggests that, total export for an industry at the average external finance dependence will increase by 1.274 percent in a country with social trust level at the 75th percentile (0.393) compared to a country with social trust level at the 25th percentile (0.186). Therefore, the result obtained in Column 1 supports our argument that social trust leads to a disproportionate export performance financially vulnerable sectors by easing access to external finance which enables firms meet up with the enormous costs associated with exporting. This argument and finding is consistent with studies suggesting that social trust expands firms access to both formal and informal credits (Duarte *et al.,* 2012; Wu *et al.*, 2014; Bottazi *et al.,* 2016; Chen *et al.,* 201; Levine *et al.,* 2018).

The subsequent two columns in in the table report the results on the differential effect of social trust on the extensive (column 2) and the intensive (column 3) export margins. In both columns, the estimated coefficients on $T_{it}Fv_s$ turn out positive and statistically significant at all conventional levels with the results indicating that it raises the extensive export margin by 13 percent and the intensive export margin by 7 percent. This means that 65 percent of greater exports from financially constrained sectors in countries with higher social trust level occur on the extensive margin, and 35 percent occur on the intensive margin. When we calculate the sizes of the effects of social trust on both margins, a one standard deviation expansion in the social trust level will increase the extensive margins by 0.591 percentage point and the intensive margins by 0.307 percentage points for an industry at the average external finance dependence. Consequently, the baseline regression results lend credence to our hypothesis that higher social trust level leads to a faster increase in the export of more financially constrained sectors.[6]

[6] In an unreported result we perform two additional analyses to test the robustness of our baseline specification. First, we remove the sector fixed effects and control for the financial vulnerability indicator. Second, we interact the

Furthermore, the results observed on both margins suggest that this differential export effect of social trust works along the extensive and intensive margin (as indicated by the statistical significance). However, the extensive margin accounts for a larger portion of the effect (as indicated by the sizes of the coefficients of the two export margins). The results further lead to the conclusion that social trust leads to both export diversification (extensive margin) and the intensity of export flows (intensive margin). Regarding our control variables, across each specified model in the Table, the obtained coefficients are in line with their *a priori* expected signs where statistically significant. The exception to this is the importer GDP in columns (3) where coefficient albeit is negative, it is also highly statistically significant.

<< Insert Table 2>>

3.2. Robustness Checks

The baseline regression results are strongly in favour of our hypothesis. In this section, we subject the baseline regression results to a series of sensitivity analyses to ascertain whether our results are robust. To save space, we only report the estimated coefficients on our measure of social trust and its interaction with financial vulnerability.

3.2.1 Zero Trade Observations and Endogeneity Related Issues

This section addresses four issues that have been discussed in the recent literature on the gravity model, namely the multilateral resistance term (MRT), zero trade observation, heteroskedasticity, and endogeneity which have potentials of altering our conclusion in the preceding section.

Anderson & van Wincoop (2003) have shown that trade between two countries is decreasing in their bilateral trade costs relative to the corresponding average with all their partners, rather than to absolute trade costs, an effect they refer to as Multilateral Resistance Term (MRT). Failing to control for such effects can bias the results obtained from gravity models, with a number of solutions proposed in the recent literature. Although we have tried to control for this using

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financial vulnerability indicator with time dummy and see if the effect changes over time. In both cases, we obtain similar results as those reported in Table 1.

exporter, importer and sector fixed effects as suggested by (Feenstra, 2004), given that we adopt a time-varying panel data, the included fixed effects may not adequately address the MRT as they may be time-varying. Baldwin & Taglioni (2006) suggest including time-varying importer and exporter fixed effects to address this concern. Such approach also controls for other potential omitted time-varying variables that may bias the result. We follow this approach and re-estimate equation (5), but this time controlling for time-varying exporter, importer, and sector fixed effects. The result of this exercise is reported in Columns (1)-(3) of Table 2. In the three columns, the coefficient estimate of $T_{it}Fv_s$ continues to be positive and statistically significant at all conventional level.

Zero bilateral trade flows are rather a norm than the exception when using gravity model. In our case this accounts for approximately 21.4 percent of the dyad trade links. In this scenario, a log transformation of the trade variable will exclude zero trade observations from being considered and this may lead to a selection bias. Santos & Tenreyro (2006) in an influential paper proposed the Poisson-Pseudo Maximum likelihood (PPML) estimator which can be applied to level trade data. Since the trade variables are not logged, we are also able to properly account for the zero trade flows. The method also has the added advantage that it solves the problem of heteroskedasticity that is pervasive in trade data which the OLS method fails to correct for. Columns (4)-(6) in Table 2 report the regression results using PPML estimator. Again, the obtained results on $T_{it}Fv_s$ for both the total export and export margins are qualitatively similar to those reported in Table 1.[7]

As argued elsewhere, our empirical strategy is less susceptible to omitted variables bias or model misspecification (Rajan & Zingales 1998; Chen, 2017). In addition, the use of sector financial vulnerability indicator that are exogenous to a country to identify the effect of a national indicator (in our case, social trust) on the outcome variable also reduces reverse causality (Rajan & Zingales 1998; Maskus *et al.,* 2019). These suggest that our estimation strategy is less prone to endogeneity. Notwithstanding this, to further minimise endogeneity that may arise due to reverse causality however, we regress contemporaneous values of export on a period lagged value of

[7] In an unreported result, we also use the inverse hyperbolic function to log transform the trade variables. The results obtained on the estimated coefficients of $T_{it}Fv_s$ are qualitatively similar to those reported in Table 1.

social trust.[8] The results for this exercise are reported in columns (7)-(9). In general, the results of $T_{it}Fv_s$ for both total export and the margins of export are qualitatively consistent with those reported in Table 1.

In summary, although we obtained sizes of estimated coefficient on the interaction term between social trust and financial vulnerability which vary across the alternative specification or estimation strategies, the results presented in Table 2 are generally consistent with those reported in Table 1, suggesting that higher levels of social trust leads to a faster increase of export from more financially constrained sectors.

<< Insert Table 3>>

3.2.2 Other Confounding Factors

A potential concern in our analysis is that social trust level may be a proxy for some other features of a country or picking the effect of some other country characteristics that are correlated with it. To address this issue, Table 3 shows the results when we interact the industry external finance dependence index with other country characteristics.

Columns (1)-(3) report the results for the total export and export margins when we augment the baseline equation (5) with indicators of "Domestic credit provided by financial sector as a share of GDP" [9] (F_{it}) – as a proxy for formal financing channels, and an interaction term between F_{it} and external finance dependence. With the exception of the result on the intensive margins, the results on the variables of interest are largely consistent with those reported in Table 1. This suggests that social trust exerts an influence on credit access that is distinct from formal credit contracting, and that works mostly along the extensive margin. For instance, Levine *et al.* (2018) in a study comprising 3,500 firms across 34 countries found that liquidity-dependent firms in high-trust countries obtain more trade credit, which are debt financing instruments that neither involve collateral nor promissory notes subject to formal judicial enforcement mechanisms.

[8] We tried to use external instruments such as indicators on religious, ethnic and language diversity. We obtained results that are consistent with our baseline results. However, the employed instruments fail to simultaneously meet the relevance and exclusion criteria test. We therefore do not report the results.

[9] Original data on this is taking from the World Bank Development Indicators.

Other informal financing such as in-person loans which are also not subject to formal judicial enforcement mechanisms are also plausible explanation.

Columns (4)-(6) show the result when we augment the baseline equation with indicators of "rule of law" [10] (Q_{it}) – as a proxy for general institutional quality, and an interaction term between Q_{it} and external finance dependence. In principle, social trust and legal institutional quality could be substitute or complement. Again, the results for both the total export and export margins are largely consistent with those reported in Table 1. Finally, Columns (7)-(9) show the results when we augment the baseline equation with indicators of "*per capita* GDP" [11] (G_{it}) – as a proxy for a country's overall level of economic development, and an interaction term between G_{it} and external finance dependence. This helps isolate the effect of social trust from any unobserved characteristics of development level that could be responsible for generating higher trade in external finance dependence sectors Again, the results for both the total export and export margins are largely consistent with those reported in Table 1.

<< Insert Table 4>>

3.2.3 Alternative Financial Vulnerability Measures

Table 4 displays the results when we use alternative measures of financial vulnerability. Columns (1)-(3) report the estimated coefficients on the interaction term between social trust and Asset tangibility. Starting with column (1), the estimated coefficient on the interaction term between social trust and Asset tangibility is positive and statistically significant at the 1 percent significance level. This indicates that higher level of social trust leads to a faster increase of export from sectors with poorly endowed tangible assets. Credits are often backed by collateral since in the event of default, credit lenders must recover their losses by exploiting the value of the hypothecated asset. Consequently, firms with poor collaterals due to their intangibility liability face higher financial constraints in accessing credit. The result is therefore consistent with that of Table 1 in suggesting a faster export increases from more financially constrained sectors as the levels of social trust rises. One of the possible explanations for this is that social

[10] Original data on this is taking from the World Governance Indicators.
[11] Original data on this is taking from the World Bank Development Indicators.

trust mitigates moral hazards through peer monitoring and social pressure which are seen as more effective ways of achieving compliance (Arnott & Stiglitz, 1991). Consequently, although firms may face the liability of asset intangibility, higher social trust level enables them to overcome this liability. This argument is consistent with Hilary and Huang (2015) which found empirical evidence that firms endowed with greater community trust in the USA experience less over-investment in tangible assets.

Columns (2)-(3) report the results for the different export margins. In both columns, the estimated coefficients on the interaction term between social trust and Asset tangibility have the expected signs. Consistent with those reported in Table 1, we also observe that the estimated coefficient of $T_{it}Fv_s$ on the extensive export margins is higher than that of the intensive margin (in absolute terms) thereby corroborating the initial finding that the impact at the extensive margin is larger. Contrary to the baseline result however, only the estimated coefficient of $T_{it}Fv_s$ on the extensive export margin is statistically significant. Columns (4)-(6) display the results when we use liquidity needs as an indicator of sector financial vulnerability. The results for both the total export and export margins are qualitatively consistent with those reported in columns (1)-(3). Finally, columns (7)-(9) display the results when we use R&D intensity as an indicator of sector financial vulnerability. The results for both the total export and export margins are generally consistent with those reported in Table 1.

In summary, whereas we find that the baseline regression results of $T_{it}Fv_s$ for the total export and extensive margin are robust to alternative measures of financial vulnerability; results for the intensive margin are not.

<< Insert Table 5>>

3.2.4. Alternative Decomposition Method

Another potential concern is that the baseline regression results may be driven by the specific decomposition of the margins that has been used in this article. As such, we test the robustness of the baseline regression results to an alternative decomposition methods. We follow Dutt *et al*. (2013) to define the extensive margin as a simple count of the total number of 6-digits HSC

product N_{ijst}^{HSC} exported by country i from sector s to country j in period t. The intensive margin, $\bar{x}_{ijt} = TE_{ijst}^{HSC}/N_{ijst}^{HSC}$, is then the average value of per product traded. Total export, TE_{ijst}^{HSO}, is therefore given as the product of both margins:

$$TE_{ijst}^{HSC} = \bar{x}_{ijt} \times N_{ijst}^{HSC} \quad (6)$$

Again, taking logs we have

$$logTE_{ijst}^{HSC} = log\bar{x}_{ijt} + logN_{ijst}^{HSC} \quad (7)$$

We re-estimate our gravity model using these alternative export indicators, with the results reported in Table 5. Consistent with the results reported in Table 1, the estimated coefficient on $T_{it}Fv_s$ is positive and statistically significant at all conventional levels both for the total export and export margins.[12] Unlike the results reported in Table 1 however, the coefficient estimate of $T_{it}Fv_s$ is larger for the intensive margin than for the extensive margin. Accordingly, the magnitudes of the differential effect of social trust on financially constrained sectors seem to depend on the decomposition method used.

4. Conclusion

Under financially constrained circumstances, trust may ease access to alternative sources of finance, including informal credits. This is especially relevant in the literature on trade that shows financially vulnerable sectors may improve their poor performance when high levels of trust are established in the environments they operate. In this study we were interested in exploring the effects of social trust on export performance of financially vulnerable sectors using a large sample of developed and developing countries. Social trust may reduce information asymmetry between borrowers and lenders, decrease hazards and ease access to informal and other financial resources.

[12] In an unreported result, we estimate the extensive margin using the Poisson model since the dependent variable here is a count variable. The result is qualitatively similar to that of the reported OLS.

For our analysis, we used bilateral trade data across 50 developed and developing countries and applied the factor-proportion model to investigate how social trust affects total exports, number of products exported (export extensive), and the volume of exported products (export intensive). We interact the indicator of sectors' financial vulnerability with countries' levels of social trust. The results showed that social trust plays an important alleviating role in the relationship between the different measures of trade and the indicators of financial vulnerability. In fact, the estimated coefficient on the interaction term showed countries that record high levels of social trust have higher trade performance in financially vulnerable sectors than countries with lower levels of social trust. These results are robust to the use of alternative indicators of financially vulnerable sectors and trade decomposition methods and to different specifications.

The results of this paper confirm earlier findings that trust increases trade performance in developed countries. In countries with low financial development, where financially vulnerable sectors may face constraints in accessing credit, policies that build more social trust can incentive informal finance mechanisms that may mitigate the negative effects limited access to formal finance has on economic growth. However, the CANA trust-based social capital indicator used in this analysis is a survey-based measure, which for many developing countries it is only available for few years. Although our empirical strategy controls for time-varying effects that may affect the indicators of trust, more data on trust are needed to strengthen the link between trust-based social capital and trade performance under financial constraints in developing countries.

References

Amiti, M., & Weinstein, D. (2011). Exports and financial shocks. *Quarterly Journal of Economics,* 126(4), 1841–1877.

Anderson, J., & van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review*, 93(1), 170–192

Arnott, R., & Stiglitz, J. (1991). Moral hazard and nonmarket institutions: Dysfunctional crowding out or peer monitoring? *American Economic Review,* 81(1), 179–190.

Arrow, K. (1972). Gifts and exchanges. *Philosophy and Public Affairs,* 1(4), 343-362.

Baldwin, R., & Taglioni, D. (2006). *Gravity for dummies and dummies for gravity equations*. NBER Working Paper #. 12516.

Bottazzi, L., Da Rin, M., & Hellmann, T. (2016). The importance of trust for investment: Evidence from Venture Capital. *Review of Financial Studies*, 29(9), 2283-2318.

Castellacci, F., & Natera, J. (2011). A new panel dataset for cross-country analyses of national systems and development (CANA). *Innovation and Development*, 1(2), 205-226.

Cason, T., Gangadharan, L., & Maitra, P. (2012). Moral hazard and peer monitoring in laboratory microfinance experiment. *Journal of Economic Behavior & Organization*, 82(1), 192–209.

Chen, D., Liu, X., & Wang, C. (2016). Social trust and bank loan financing: Evidence from China. *Abacus*, 52(3), 374–403.

Chen, W. (2017). Do stronger intellectual property rights lead to more R&D intensive imports? *Journal of International Trade and Development,* 26(7), 865-883.

Crino, R., & Ogliari, L. (2017). Financial frictions, product quality and international trade. *Journal of International Economics*, 104(3), 63-84.

Duarte, J., Siegel, S., & Young, L. (2012). Trust and credit: The role of appearance in peer-to-peer lending. *Review of Financial Studies,* 25, 2455-2484.

Dutt, P., Mihov, I., & van Zandt, T. (2013). The effect of WTO on the extensive and the intensive margins of trade. *Journal of International Economics*, 91(2), 204–219.

Feenstra, R. C. (2004). *Advanced international trade: Theory and evidence*. Princeton, MA: Princeton University Press.

Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. *American Economic Review*, 94(3), 526-556.

Guiso, L., Sapienza, P., & Zingales, L. (2009). Cultural biases in economic exchange. *Quarterly Journal of Economics*, 124(3), 1095–1131.

Hasan, M., & Habib, A. (2019). Social capital and trade credit. *International Review of Financial Analysis*, 61, 158-174.

HIlary, G., & Huang, S. (2015). *Trust and contracting*. INSEAD Working Paper No. 2015/42/ACC.

Hummels, D., & Klenow, P. (2005). The variety and quality of a nation's exports'. *American Economic Review*, 96(3), 704–23.

Jha, A. (2019). Financial reports and social capital. *Journal of Business Ethics*, 155(2), 567-596.

Manova, K., Wei, S-J., & Zhang, Z. (2011). *Firm exports and multinational activity under credit constraints*. NBER Working Paper #16905.

Karlan, D. (2005). Using experimental economics to measure social capital and predict real financial decisions. *American Economic Review*, 95(5), 1688–1699.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics* 112(4), 1251-1288.

Levine, R., Lin, C., & Xie, W. (2018). Corporate resilience to Banking crises: The role of trust and trade credit. *Journal of Financial & Quantitative Analysis*, 53(4), 1441-1477.

Manova, K. (2013). Credit constraints, heterogeneous firms, and international trade. *Review of Economic Studies*, 80, 711–744

Manova, K., Wei, S-J., & Zhang, Z. (2015). Firm exports and multinational activity under credit constraints. *Review of Economics and Statistics*, 97(3), 574-588.

Maskus, K., Milani, S., & Neumann, R. (2019). The impact of patent protection and financial development on industrial R&D. *Research Policy*, 48, 355-370.

Melitz, J., & Toubal, F. (2019). Somatic distance, trust and trade. *Review of International Economics,* 27(3), 786-802.

Nguyen, Q., & Bernauer, T. (2018). Does social trust affect public support for international trade? Insights from an experiment in Vietnam. *Political Studies,*1–19

Rajan, R., & Zingales, L. (1998). Financial dependence and growth. *American Economic Review,* 88(3), 559-586.

Roy, D., Munasib, A., & Chen, X. (2014). Social trust and international trade: The interplay between social trust and formal finance. *Review of World Economy*, 150(4), 693-714.

Santos. J., & Tenreyro, S. (2006). Log of gravity. *Review of Economics and Statistics*, 88(4), 641-658.

Spring, E., & Grossmann, V. (2016). Does bilateral trust across countries really affect international trade and factor mobility? *Empirical Economics*, 50, 103-136.

Wu, W., Firth, M. & Rui, M. (2014). Trust and the provision of trade credit. *Journal of Banking & Finance*, 39(3), 146–159.

Xing, W., & Zhou, L. (2018). Bilateral trust and trade: Evidence from China. *World economy*, 41, 1918–1940.

Yu, S., Sjoerd, B., & de Haan, J. (2015). Trade, trust and the rule of law. *European Journal of Political Economy,* 37, 102-115.

Zak, P., & Knack, S. (2001). Trust and growth. *Economic Journal*, 111, 295-321.

Table 1A: List of Countries

Argentina	Hungary	Portugal
Austria	Iceland	Romania
Bangladesh	India	Russia
Belgium	Indonesia	Singapore

Brazil	Ireland	South Africa
Canada	Italy	Spain
Chile	Japan	Sweden
China	Jordan	Switzerland
Colombia	Malaysia	Thailand
Czech Republic	Mexico	Turkey
Denmark	Netherlands	Tanzania
Ethiopia	New Zealand	Ukraine
Finland	Nigeria	United Kingdom
France	Norway	United States
Germany	Peru	Venezuela
Ghana	Philippines	Zambia
Greece	Poland	

Table 2A: Measures of Sector Financial Vulnerability

Industry	ISIC	External Finance Dependence	Asset Tangibility	R&D Intensity	Liquidity Needs
Food products	311	0.137	0.378	0.010	0.100

Beverages	313	0.077	0.279	0.000	0.100
Tobacco	314	-0.450	0.221	0.000	0.280
Textiles	321	0.401	0.373	0.000	0.170
Wearing apparel, except footwear	322	0.029	0.132	0.010	0.210
Leather Products	323	-0.140	0.091	0.010	0.230
Wood, products, except furniture	331	0.284	0.380	0.010	0.110
Furniture, except metals	332	0.236	0.263	0.010	0.150
Paper and products	341	0.176	0.558	0.010	0.130
Printing & Publishing	342	0.204	0.301	0.010	0.070
Industrial Chemicals	3511	0.205	0.412	0.030	0.140
Chemicals, other	352	0.219	0.197	0.020	0.150
Petroleum refineries	353	0.042	0.671	0.000	0.070
Misc. petroleum and coal products	354	0.334	0.304	0.010	0.120
Rubber products	355	0.227	0.379	0.020	0.150
Plastic products	356	1.140	0.345	0.020	0.130
Pottery, China, Earthworm	361	-0.150	0.075	0.020	0.170
Glass and glass products	362	0.529	0.331	0.020	0.150
Other non-metallic mineral products	369	0.062	0.420	0.010	0.150
Iron & Steel	371	0.087	0.458	0.010	0.170
Non-ferrous metals	372	0.006	0.383	0.010	0.160
Fabricated metal products	381	0.237	0.281	0.010	0.170
Machinery, exc. Electrical	382	0.445	0.183	0.020	0.200
Machinery, electric	383	0.768	0.213	0.070	0.180
Transport equipment	384	0.307	0.255	0.020	0.180
Professional & Scientific Equipment	385	0.961	0.151	0.090	0.210
Other manufactured products	390	0.470	0.188	0.020	0.200

***Sources**: Manova et al. (2011) and Manova (2013)*

Table 3A: Correlation Matrix

	logTot	*logExt*	*logInt*	*Soc_trt*	*EFD*	*logDist*	*logGDPE*	*logGDPI*	*Border*	*Comlan*	*Colony*
logTot	1.000										
logExt	0.753	1.000									
logInt	0.875	0.341	1.000								
Trust	0.291	0.303	0.194	1.000							
EFD	-0.055	-0.064	-0.031	-0.013	1.000						
logDist	-0.381	-0.336	-0.297	-0.118	0.029	1.000					
logGDPE	0.687	0.573	0.561	0.256	-0.041	0.020	1.000				
logGDPI	-0.063	0.236	-0.263	-0.061	-0.027	-0.020	-0.065	1.000			
Border	0.284	0.169	0.281	-0.020	-0.014	-0.409	0.025	0.050	1.000		
Comlan	0.110	0.071	0.106	-0.079	-0.004	-0.019	-0.022	-0.033	0.176	1.000	
Colony	0.107	0.112	0.071	-0.013	-0.011	-0.018	0.055	0.063	0.131	0.298	1.000

Table 1: Baseline Results

	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$
	[1]	[2]	[3]
T_{it}	-0.024	-0.002	-0.022
	[0.103]	[0.055]	[0.100]
$T_{it}Fv_s$	**0.190**	**0.125**	**0.065**
	[0.026]***	**[0.018]*****	**[0.019]*****
$lnDist_{ij}$	-1.115	-0.388	-0.727
	[0.029]***	[0.016]***	[0.023]***
$lnGDP_{it}$	0.394	0.153	0.241
	[0.030]***	[0.015]***	[0.029]***
$lnGDP_{jt}$	0.011	0.233	-0.222
	[0.025]	[0.013]***	[0.023]***
$Border_{ij}$	0.362	-0.089	0.451
	[0.107]***	[0.070]	[0.081]***
$Language_{ij}$	0.281	0.242	0.039
	[0.073]***	[0.041]***	[0.057]
$Colony_{ij}$	0.576	0.268	0.308
	[0.103]***	[0.060]***	[0.074]***
R-Square	0.82	0.74	0.72
# Observation	676,086	676,086	676,086

*** p<0.01, ** p<0.05, * p<0.10. Standard errors clustered at the country-pair level in square brackets. Each column contain unreported sector, year, importer and exporter fixed effects.

Table 2: Zero Trade Observations & Endogeneity

	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$	Tot_{it}	Ext_{it}	Int_{it}		$lnExt_{it}$	$lnInt_{it}$
	Time-Varying Fixed Effects			PPML				Lagged Trust	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
T_{it}				-0.206	-0.033	-1.028	-0.147	0.03	-0.177
				[0.178]	[0.038]	[0.420]**	[0.102]	[0.055]	[0.098]*
$T_{it}Fv_s$	**0.182**	**0.121**	**0.06**	**0.098**	**0.205**	**0.256**	**0.195**	**0.131**	**0.064**
	[0.026]***	**[0.017]*****	**[0.019]*****	**[0.009]*****	**[0.008]*****	**[0.035]*****	**[0.026]*****	**[0.018]*****	**[0.019]*****
R2	0.82	0.74	0.73	0.88	0.77	0.25	0.82	0.74	0.72
N	676,086	676,086	676,086	859,950	859,950	859,950	626,618	626,618	626,618

* p<0.1; ** p<0.05; *** p<0.01. Standard errors clustered at the country-pair level in squared brackets. Each column contain unreported sector, year, importer and exporter fixed effects. They also contain unreported gravity variables' coefficients as reported in Table 1.

Table 3: Potential Confounding Factors

	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$
	Financial Development			Institutional Quality			Economic Development		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
T_{it}	-0.035	0.004	-0.039	-0.012	-0.001	-0.011	-0.041	0.038	-0.079
	[0.104]	[0.055]	[0.100]	[0.103]	[0.055]	[0.100]	[0.104]	[0.056]	[0.100]
$T_{it}Fv_s$	**0.118**	**0.093**	**0.025**	**0.131**	**0.116**	**0.014**	**0.154**	**0.127**	**0.027**
	[0.025]***	**[0.017]*****	**[0.018]**	**[0.026]*****	**[0.018]*****	**[0.020]**	**[0.025]*****	**[0.017]*****	**[0.019]**
F_{it}	-0.089	-0.009	-0.08						
	[0.019]***	[0.010]	[0.018]***						
$F_{it}Fv_s$	0.028	0.012	0.016						
	[0.006]***	[0.004]***	[0.006]***						
$Q_{it}Fv_s$				0.016	0.002	0.013			
				[0.006]***	[0.004]	[0.005]***			
Q_{it}				-0.221	-0.066	-0.155			
				[0.044]***	[0.022]***	[0.039]***			
G_{it}							0.245	-0.372	0.616
							[0.193]	[0.112]***	[0.193]***
$G_{it}Fv_s$							0.008	0.000	0.008
							[0.003]**	[0.003]	[0.003]***
R-Square	0.82	0.74	0.72	0.82	0.74	0.72	0.82	0.74	0.72
#Observation	676,086	676,086	676,086	676,086	676,086	676,086	676,086	676,086	676,086

* p<0.1; ** p<0.05; *** p<0.01. Standard errors clustered at the country-pair level in squared brackets. Each column contain unreported sector, year, importer and exporter fixed effects. They also contain unreported gravity variables' coefficients as reported in Table 1.

Table 4: Alternative Financial Vulnerability

	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$	$lnTot_{it}$	$lnExt_{it}$	$lnInt_{it}$
	Intangibility			Liquidity			R&D		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
T_{it}	0.084	0.078	0.007	-0.049	-0.061	0.012	-0.012	0.007	-0.018
	[0.104]	[0.056]	[0.101]	[0.105]	[0.057]	[0.101]	[0.103]	[0.055]	[0.100]
$T_{it}Fv_s$	**0.187**	**0.151**	**0.036**	**0.488**	**0.592**	**-0.103**	**2.159**	**1.372**	**0.787**
	[0.047]***	**[0.035]*****	**[0.037]**	**[0.141]*****	**[0.106]*****	**[0.109]**	**[0.361]*****	**[0.259]*****	**[0.267]*****
R-Square	0.82	0.74	0.72	0.82	0.74	0.72	0.82	0.74	0.72
#Observation	676,086	676,086	676,086	676,086	676,086	676,086	676,086	676,086	676,086

* p<0.1; ** p<0.05; *** p<0.01. Standard errors clustered at the country-pair level in squared brackets. Each column contain unreported sector, year, importer and exporter fixed effects. They also contain unreported gravity variables' coefficients as reported in Table 1.

Table 5: Alternative Decomposition

	$lnTot_{it}$		$lnExt_{it}$		$lnInt_{it}$	
	[1]	[2]	[3]	[4]	[5]	[6]
T_{it}	-1.171		-0.417		-0.754	
	[0.108]***		[0.051]***		[0.081]***	
$T_{it}Fv_s$	**4.252**	**4.25**	**1.477**	**1.473**	**2.776**	**2.777**
	[0.167]***	**[0.168]*****	**[0.058]*****	**[0.058]*****	**[0.125]*****	**[0.125]*****
R-Squared	0.68	0.68	0.78	0.78	0.51	0.52
# Observation	676,094	676,094	676,094	676,094	676,094	676,094

* p<0.1; ** p<0.05; *** p<0.01. Standard errors clustered at the country-pair level in squared brackets. Columns 1, 3 and 5 contain unreported sector, year, importer and exporter fixed effects. They also contain unreported gravity variables' coefficients as reported in Table 1. Columns 2, 4 and 6 contain unreported year and time-varying sector, importer and exporter fixed effects. With the exceptions of importer and exporter GDP, they contain unreported variables' coefficients as reported in Table 1.

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