

EXPORT, INVEST OR PARTNER? THE IMPACT OF FREE TRADE AGREEMENTS ON US FIRMS' INTERNATIONAL ENTRY METHODS

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The choices available to firms entering foreign markets are complex yet crucial, and while Free Trade Agreements (FTAs) can provide essential support, the value of these remains unclear. This paper therefore evaluates the impact of FTAs on firms' choice of entry into foreign markets. Using an extensive panel dataset of 137 trading partners of the United States, linear and non-linear multivariate regressions are employed to evaluate the separate relationships, while a non-parametric estimation is used to compare evidence across method of entry. Results reveal that FTAs actively promote exporting at the expense of investing and partnering. An interconnected relationship between methods is inferred and linked through their dependence on recipients' cultural and societal differences to the US. Consequently, the recognised benefits of FTAs may be more nuanced, promoting exporting at the cost of other investment types.

Keywords: Free Trade Agreements; Foreign Direct Investment; Exports; Joint Ventures; Entry Mode; Gravity Model; Cultural Distance; Panel Data

JEL Classification: F13; F14; F15; F21; F23; C23

1. INTRODUCTION

For firms selling domestically looking to enter a foreign market, the institutional method of doing so is a key determinant of the likelihood of success (Anderson and Gatignon, 1986; Root, 1987; Agndal and Chetty, 2007). The wide array of options include exporting, investing in a wholly-owned local subsidiary, or entering into a joint venture, although the benefits of each option vary significantly by the individual circumstances of the domestic firm (Hill et al., 1990). The degree of control afforded to the domestic firm in the foreign country influences the risk taken on, meaning that identifying an appropriate method is a complex and precarious process. However,

potential benefits of a successful venture are significant, providing technology, finance and knowledge diffusion for both parties in addition to national benefits of employment and wealth (Onyusheva et al., 2018).

Free Trade Agreements (FTAs) aim to reduce the trade and investment barriers between countries, thereby promoting outward investment while reducing the associated risks (Rodrik, 2018). FTAs are seen as an increasingly important catalyst for foreign entry, providing long term stability for firms to create relationships and engage in investment. The United States (US) has long been an advocate of FTAs, making its first agreement in 1985 and continuing to do so, as shown in Table 1. It has agreements with a variety of economically diverse countries, and is the largest country in the world for outward investment and joint ventures with the two largest global stock exchanges (NYSE and NASDAQ) (UNCTAD, 2023a; UNCTAD, 2023b). Despite recent emergence of a more protectionist agenda, agreements continue to be formed and foreign-market entry from the US remains the highest in the world.

Table 1. US Free Trade Agreements

Agreement ^a	Date of Signature	Date into Force
Australia	May. 2004	Jan. 2005
Bahrain	Sep. 2005	Aug. 2006
Chile	Jun. 2003	Jan. 2004
Colombia	Nov. 2006	May. 2012
Dominican Republic	Aug. 2004	Mar. 2006
Israel	Apr. 1985	Aug. 1985
Jordan	Oct. 2000	Dec. 2001
Morocco	Jun. 2004	Jan. 2006
Oman	Jan. 2006	Jan. 2009
Panama	Jun. 2007	Oct. 2012
Peru	Apr. 2006	Feb. 2009
Singapore	May. 2003	Jan. 2004
South Korea	Jun. 2007	Mar. 2012
NAFTA ^b	Dec. 1993	Jan. 1994
USMCA ^c	Nov. 2018	Jul. 2020

Notes: The table lists all free trade agreements between the United States and a partner country in force over the 1995–2022 sample period.^a Data from the World Trade Organisation (2024).^b North American Free Trade Agreement.^c United States–Mexico–Canada Agreement, superseding NAFTA. NAFTA and USMCA each cover both Canada and Mexico, so the partner-country counts in Table 4 are defined over countries rather than agreements.

Notwithstanding the US commitment to FTAs, empirical evidence for their benefits has been limited and contrasting due to the myriad methods of entry, particularly through factors such as FTAs' investment provisions and the host country's location advantages (Feils and Rahman, 2008). The impact of FTAs on individual entry methods therefore remains under debate and current analysis fails to provide insights into how FTAs influence foreign entry decisions. For the US, general focus has been on

individual agreements or methods rather than a holistic approach (Kogut and Singh, 1988; Helpman et al., 2004; Sánchez-Peinado et al., 2007). The question of how US firms react to FTAs over the spectrum of methods therefore remains under explored, particularly in the case of joint ventures. Accordingly, the focus of this paper is to understand the dynamics introduced by FTAs on entry methods in the case of the US.

More specifically, this paper will empirically evaluate the relationship between FTAs and exports, foreign direct investment (FDI) and joint ventures in the US. Firstly, the impact of FTAs will be explored separately on each entry method, using linear and non-linear techniques to determine the individual effects. Comparisons will then be drawn between each entry method to understand the interrelationships between them, using non-parametric estimation to be able to compare across them. This will be achieved by using a novel and comprehensive dataset, providing results which will give insight into how firms' international entry methods are impacted by FTAs and help shape macroeconomic policy and business behaviour.

This paper will proceed as follows; Section 2 summarises existing literature, Section 3 provides a description of the data, Section 4 proposes a methodology to follow, Section 5 explores results and robustness, and Section 6 draws conclusions.

2. PREVIOUS WORK

Methods of classifying entry methods for firms seeking to enter a foreign market are largely based upon the proportion of ownership granted to the incoming firm (Robinson, 1978; Anderson and Gatignon, 1986). These methods range from exporting goods into the foreign market to purchasing a wholly owned subsidiary, respectively affording the least and most ownership to the domestic firm. Hill et al. (1990) and later Feenstra (2004) provide a more condensed definition, categorising ownership into three methods: exporting, engaging in joint ventures, or directly investing (FDI). Joint ventures are taken here to mean a commercial enterprise undertaken jointly by entities which retain their distinct identities (Feenstra, 2004). This categorisation provides a full spectrum of variables which have regularly reported data, and will be used as the basis of study in this paper.

For investment decisions, the most pervasive framework – the Eclectic Paradigm – states that there are three factors a firm should consider: Ownership, Location and Internalisation (Dunning, 1980). These factors examine whether there are ownership advantages such as branding, copyright, trademark or patent rights, location advantages to performing specific functions within a particular nation, or internalisation advantages to producing a product in-house, as opposed to hiring a third-party. Both quantitative and qualitative research supporting the framework is abundant and speaks to the real decisions made by firms (Agarwal and Ramaswami, 1992; Cruz et al., 2022). For

exporting, a number of models exist which estimate the best decision, foremost being the Gravity Trade Model (Tinbergen, 1962). This model estimates trade as a product of the two countries' GDPs over the distance between them with surprising accuracy, promoting proximity and barriers to entry as key factors in the decision.

FTAs seek to eliminate these barriers to trade and investment between countries, encouraging firms to engage in international markets, and driving increased productivity for firms and higher welfare for consumers (Krugman, 1980). Despite these benefits, there are arguments against implementing FTAs such as reducing overall trade by diverting it from other partners (Wonnacott, 1996). Furthermore, nascent industries in the initiating country can receive exposure to international competition too soon, impacting unemployment and even GDP (Gasiorek et al., 2019). Nevertheless, overwhelming theory suggests that FTAs should lead to increased international entry in some form and provides a theoretical basis to build on (Krugman, 1980).

The benefits of FTAs to the US have been considered in numerous studies, which focus on a range of agreements and specifically the influential North America Free Trade Agreement (NAFTA). Due to the economic size and development of the US, evidence suggests that FTAs promote the home market effect, whereby goods which have large economies of scale and high transport costs will tend to be produced in and exported by countries with a large domestic demand, supported in Worth (1998) and Head and Ries (2001) (Krugman, 1980). Studies of NAFTA seem to confirm this. For example, Gould (1998) found that NAFTA had extremely positive effects on trade between the US and Mexico and minor positive effects for trade with Canada. FDI flows similarly increased into the NAFTA region according to Feils and Rahman (2008), with the US and Canada receiving the main benefits of this. Theory therefore suggests that the US's FTAs should be beneficial specifically for US firms.

Empirical evidence remains ambivalent to these effects. In the case of exporting, a number of studies have estimated the effects on the US as well as other countries. Early analyses of the gravity trade model applied to the US found that FTAs had a positive effect on trade flows, an example being the US-Israel FTA 1985 (Sawyer and Sprinkle, 1986). Anderson and Wincoop (2003) later confirmed that land borders and proximity to trading partners are key considerations in the success of NAFTA. Outside of the US, Islam et al. (2014) studied the effect of the South Asian Free Trade Area on trade, finding a small positive coefficient of 0.17 to the member countries from trade globally, most likely limited by the shallow scope of that agreement. Similarly, Geda and Yimer (2023) found a larger coefficient of 1.9 for boosted intra-African exports through the African Continental Free Trade Area, providing evidence for other countries at different stages of development to the US. A unifying determinant of the scale of effect of FTAs in these analyses is the depth of the agreement and the economic differences or similarities between member countries. FTAs are written supporting exports and low-equity entry methods, compounding these beneficial effects.

FDI has been subject to similar scrutiny with less conclusive results since effectiveness depends on a wider variety of factors. Key amongst these is the

differentiation between horizontal and vertical FDI, whereby firms purchase companies with similar operation types or those at different stages of their supply chain. By reducing dependence upon movement of physical products, distance becomes less crucial as a determinant of success and is replaced by less tangible factors. Due to this, Ethier and Markusen (1996) formulated the Knowledge-Capital model to explain differences to the gravity model, whereby three factors replace physical distance: economic dispersion, skill differentials and barriers to trade. This formulation has been empirically shown to capture FDI flows more successfully, though each factors' direction and magnitude of impact has not been conclusive. Bae and Jang (2013) show that FTAs stimulate a 46% increase in Korean outward FDI which predominantly depends on the skill dispersion between Korea and its partners, although they found inward investment flows fell by 81%, similar to the conclusions of Reed et al. (2016) for 20 OECD countries. However, this negative effect on inward investment is not universal; Li et al. (2016) found that inward FDI increased by 13% for the ASEAN¹-China group from other member states. One explanation for this may be a greater dependence on intrinsic economic factors than exports, and an FTA may encourage or discourage investment depending on the broader circumstances of the agreement.

Joint ventures are a more elusive concept, and can range from high equity risk pooling to low equity licensing, meaning that the significant factors affecting them vary by empirical study. In particular, social, cultural and economic differences between participating countries have been shown to be key determinants. Kogut and Singh (1988) assesses this using a cultural dimensions index with US firms as the base of study, finding that greater cultural similarity between the US and the partner country favours joint ventures over acquisitions. Yet other studies have come to different conclusions due to the ambiguous concept of culture; a meta-analysis of 66 samples in Tihanyi et al. (2005) finds no relationship between culture and entry method, while Sánchez-Peinado et al. (2007) finds strong links supporting cultural effects particularly for the service industry. One explanation for this may be the investment risk of the venture which varies firm to firm, preventing reliable conclusions from being drawn (Brouthers and Brouthers, 2001). As FTAs are seen to lower this international risk, it can be inferred that FTAs may exacerbate the effects of cultural distance, making their impact on joint ventures more uncertain.

Numerous studies have also drawn comparisons between these methods in varying capacities. Investigating the decision between exporting and investing, Helpman et al. (2004) found that for US and European firms, productivity had the greatest influence on the decision, whereby only the most productive firms can take on investment risk. Similar conclusions are drawn for Asian firms in Head and Ries (2003). Introducing an FTA in this scenario would lower trade barriers and encourage market links, allowing less productive firms to enter international markets and boosting relative export levels to FDI. In assessing joint ventures, Kogut and Singh (1988) and Sánchez-Peinado et al.

¹. Association of Southeast Asian Nations

(2007) compare them to acquisition and greenfield investment, finding that full-control entry methods are preferred in more politically and economically stable countries, supporting other views such as Anderson and Gatignon (1986). Two key implications for FTAs can be derived from these findings; firstly, the importance of skill differentials and measurements of productivity, and secondly the significance of cultural, economic and social characteristics of the country in question.

FTAs have therefore been shown to have a positive effect in stimulating exports, particularly in the case of the US. Although the magnitude of effect remains open to debate, this suggests that the results expected in this paper will show a similar positive relationship. Studies of FDI results are less conclusive, depending on the dominant type of FDI flow. The US is likely to show high levels of both horizontal and vertical investment; its economic size and high income level relative to other countries supports the view of vertical FDI, whereas the high volumes of FDI to high income European countries supports horizontal (Ethier and Markusen, 1996). Based on similar high-income country studies and the data presented, the effect may be dominated by horizontal FDI which induces a negative relationship (Reed et al., 2016). The effectiveness of joint ventures has the least empirical support, yet its proven link with FDI and reliance on situational risk provides basis for a similar effect from FTAs. However, intangible factors play a greater determining role which could compound the effects of FTAs.

Despite the connections drawn between different entry methods, a direct comparison between exports, FDI and joint ventures has yet to be made. One reason for this may be data limitations; exports and FDI are typically reported at a macro level while joint ventures are commonly micro data (Sánchez-Peinado et al., 2007). Furthermore, empirical techniques vary between the FDI/joint venture and export/FDI comparison. The majority of research in the former uses survey or firm-level data, while the latter uses national figures which homogenise firms, precluding a macro comparison between them. Despite this, comparisons can still be made between studies and applied to this paper. Helpman et al. (2004) and Head and Ries (2003) support the theory that exports will receive the greatest benefit from FTAs over FDI due to the increase in low productivity firms entering the international market. Similarly, Kogut and Singh (1988) and Sánchez-Peinado et al. (2007) evidence the importance of economic stability and cultural barriers for FDI and joint ventures; by reducing social barriers, FTAs may consequently compound their relative importance when adjusted.

Empirical evidence for the US suggests a significant effect of FTAs on the way firms enter foreign markets (Sawyer and Sprinkle, 1986; Reed et al., 2016). For specific methods, different analyses and conclusions hinder comparison between them, and those papers which do compare either diverge in results or omit the impact of FTAs. This paper seeks to create a holistic comparison, investigating the effect of FTAs on each entry method to ascertain the way in which firms enter foreign markets.

3. DATA DESCRIPTION

This paper employs panel data for 137 countries over the 1995-2022 period, which are listed in Table A5 of Appendix A. The countries were selected to maximise diversity in geographical coverage and income while including a large, balanced data sample. The trends and distributions for each entry method and other key variables will first be explored, followed by the model control variables and a full sample analysis.

3.1. Dependent and Key Variables

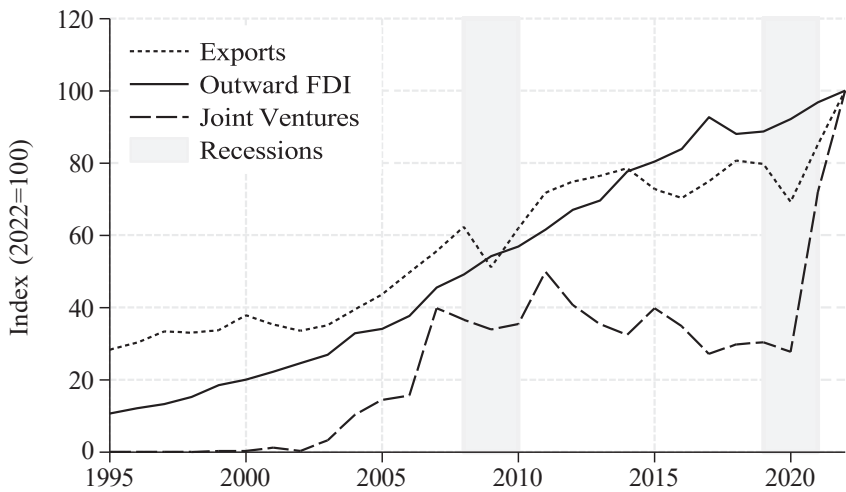
Data on exports, FDI and joint ventures were obtained from the US Census Bureau (2022), the US Bureau of Economic Analysis (2022), and Bloomberg (2024) respectively, and are represented graphically in Figure 1 with each method indexed to 100 at 2022. Exports experienced a slow upward trend of 9% average year on year (YoY) growth, but was particularly sensitive to the main economic crises of this period. The 2009 Financial Crash and the COVID-19 pandemic induced sharp declines in exports before a gradual recovery, likely due to decreased global demand and financial constraints on trade (Broll and Jauer, 2014; Cengiz and Manga, 2022). Outward FDI experienced the largest increase since 1995, recording 30% average YoY growth with less impact from the Financial Crash and COVID-19. Roughly 82% of the \$6581bn of FDI in 2022 was made up of the top 25 destinations, predominantly European countries such as the United Kingdom, the Netherlands and Luxembourg. Finally, joint ventures showed opposite trends to exports and FDI; while it trended upwards throughout this period, it experienced high growth periods during the two economic crises, seeing growth of 86% in the three years during COVID-19 in particular. This may be due to joint ventures requiring less integration with other countries than exports or FDI and so more freedom to expand in crisis (Kogut, 1989).

Outward FDI is not fully observed. The Bureau of Economic Analysis suppresses country-year cells in which a single US firm accounts for the entire position, so that the firm cannot be identified, and 327 of the 3,836 potential country-year observations (8.5%) are withheld on this basis. As suppression is triggered by the number of investors rather than by the size or direction of the flow, these observations are treated here as missing completely at random and are recovered using the cubic spline described in Section 4.2, which fills 311 of them and leaves 16 at the ends of country series unfilled. The interpolated series, S(OFDI), is reported alongside the observed series in Table 2. Suppressed observations are single-investor positions by construction and are correspondingly small, representing 8.5% of observations but contributing under 0.5% of the total value of the interpolated series, with the average suppressed position being less than a twentieth of the average observed one. Interpolated values are nonetheless not equivalent to directly observed data, and the analysis is arranged to limit their reach. Every parametric estimate reported in Tables 5, 6, 8 and 9 uses observed outward FDI alone; the interpolated series enters only the non-parametric comparison of Section 5.2.

Table 2. Summary Statistics for Complete Model Variables

Variables	N	Mean	SD	Min	Max	Skewness	Kurtosis	Unit ^a	SB Unit ^b
Dependent Variables									
EXP	3,836	8,519	28,136	0.00	356,453	7.16	63.64	0.00	-
ln(EXP)	3,830	6.73	2.38	-1.61	12.78	-0.01	2.41	0.00	-
OFDI	3,509	25,861	90,486	-584.00	1,077,519	6.35	50.89	0.66	-
S(OFDI)c	3,820	23,850	86,991	-584.00	1,077,519	6.63	55.33	0.00	-
ln(OFDI)	3,152	7.23	2.99	0.00	13.89	-0.25	2.55	0.00	-
JVA	3,836	0.62	5.30	0.00	263.00	36.73	1,682	0.00	-
Key Variables									
EFI	3,697	61.03	12.56	0.00	90.50	-1.51	8.90	0.00	-
CD	3,276	1.89	0.87	0.08	4.20	0.20	2.98	-	-
FTA	3,836	0.07	0.26	0.00	1.00	3.33	12.08	-	-
Main Controls (A/B)									
ln(GDP)	3,836	28.09	1.95	22.55	34.28	-0.01	2.60	0.98	0.04
ln(DIST)	3,836	8.96	0.53	6.32	9.70	-1.60	7.38	-	-
ln(SUMGDP)	3,836	16.50	0.34	15.85	17.84	-0.10	2.26	1.00	0.00
ln(SIM)	3,836	-4.21	1.71	-8.56	-0.69	-0.15	2.40	0.97	0.00
ln(ENLOW)	3,836	-1.41	1.09	-4.47	1.19	-0.25	2.45	1.00	0.00
ln(OPEN)	3,830	-4.02	1.44	-14.91	-0.79	-0.72	5.58	0.00	-
Other Controls (X)									
JVA BIN	3,836	0.15	0.36	0.00	1.00	1.91	4.63	-	-
ln(ER)	3,836	2.65	2.77	-6.77	15.29	0.72	2.90	0.00	-
DEFICIT	3,836	0.56	0.50	0.00	1.00	-0.23	1.05	-	-
LOCK	3,836	0.20	0.40	0.00	1.00	1.52	3.32	-	-
INTERNET	3,836	0.47	0.50	0.00	1.00	0.14	1.02	-	-
BIT	3,836	0.24	0.43	0.00	1.00	1.19	2.41	-	-
COMLANG	3,836	0.27	0.44	0.00	1.00	1.04	2.07	-	-

Notes: EXP is the value of US exports and OFDI the value of US outward foreign direct investment to country i in year t, both in millions of US dollars; JVA is the annual count of joint venture agreements. EFI is the Heritage Index of Economic Freedom score and CD the cultural distance index defined in Equation 1. JVA BIN equals 1 if there is a joint venture between the US and country i in time t. ER is the real exchange rate of country i's currency to 1 US dollar. DEFICIT equals 1 if there is a trade deficit between the US and country i in time t. LOCK equals 1 if country i is geographically landlocked. INTERNET equals 1 if country i's proportion of population using the internet is above the mean. BIT equals 1 if US and country i have a BIT in force in time t (see Appendix A for complete list). COMLANG equals 1 if country i shares a common language with the US. N varies across variables because of zero or negative values in the logged series and unreported observations for OFDI, EFI and CD. Statistics are reported to two decimal places; values of 1,000 or more are reported to the nearest unit. ^a Unit root p-values based on Fisher Phillips-Perron Unit Root Test chi2 values. ^b Structural Break Unit root p-values based on Karavias and Tzavalis (2014) Panel Test, factoring for 2009 and 2020. ^c Equals OFDI interpolated and extrapolated for missing values using a cubic spline. 327 of the 3,836 potential country-year observations (8.5%) are unreported in OFDI, of which 311 are recovered by the spline. Interpolated values are not equivalent to directly observed data



Notes: Exports, outward FDI and joint ventures are each indexed to 100 in 2022, so the series show relative growth rather than levels. Exports and outward FDI are measured in millions of US dollars and joint ventures as the annual count of agreements. Shaded bands mark the 2008-2010 Financial Crash and the 2020-21 COVID-19 recession. Sources: US Census Bureau (2022), US Bureau of Economic Analysis (2022) and Bloomberg (2024).

Figure 1. Indexed Entry Method Trends Over Time

Table 3 numerically illustrates the mean distribution of entry methods by geographical continent and income group. This paper incorporates an average of 97.6% of the total values of these variables for the US, a value which provides necessary diversity within the sample and is consistent with figures in previous literature (Bae and Jang, 2013; Duong et al., 2021). North America accounts for the greatest proportion of exports, with 36.33% of the total, followed by Asia (29.65%) and Europe (22.96%). This is primarily due to the border effect between Canada and Mexico, the only two countries with land-borders to the US (Anderson and Wincoop, 2003). Europe makes up 54.89% of total FDI, indicative of the strong integration and similarity between the US and European markets. Asia makes up the greatest proportion of joint ventures (67.54%), supporting contemporary sources for the large volume US partnerships there. By income group, high income countries make up the majority of exports and FDI from the US, trickling down to lower incomes. Particularly for FDI, high income countries make up 83% of total FDI, highlighting the potential dominance of horizontal over vertical FDI from the US. The exception, once again, is joint ventures, where China is the largest destination and an upper-middle income country. Despite the income-skew of the

sample, values are relatively evenly distributed over sub-sample groups.

Table 3. Entry Method Summary Statistics

Group	% of Total Values			Countries
	Exports	FDI	JVA	
Continent ^a				
Africa	1.57	0.86	1.74	29
Asia	29.65	13.32	67.54	40
Europe	22.96	54.89	17.29	39
North America	36.33	18.01	6.26	13
Oceania	1.96	3.20	2.45	4
South America	6.56	4.10	4.10	12
Income ^b				
Low	0.11	0.04	0.08	8
Lower-Middle	4.96	1.75	9.95	39
Upper-Middle	29.17	8.87	47.43	37
High	64.78	83.73	41.92	53
Panel coverage (%)	99.03	94.39	99.38	100.00
Mean annual total (\$m / No.)	1,167,076	3,240,880	85.61	137

Notes: Each cell reports the group's share of the worldwide annual total of US exports, US outward FDI and US joint venture agreements, averaged over the 1995-2022 period. Shares are computed against the US worldwide total rather than the panel total. Mean annual total (\$m / No.) reports the mean annual total across the panel, with exports and outward FDI in millions of US dollars and joint ventures as the number of agreements.^a Grouped by geographical continent.^b Determined by the World Bank Income Classification Groups.

The key variable of interest is FTA, which will be binary and take the value 1 if there is a free trade agreement in force between the US and country i at time t (Bae and Jang, 2013; Thangavelu et al., 2021). A complete list of US agreements can be found in Table 1 of the Introduction, obtained from the World Trade Organisation (2024). Given its importance, a country category breakdown is presented for FTA in Table 4, highlighting that the majority of agreements are made with high income countries (60%) and no agreements made with low income countries. Given this disparity, aggregation bias is possible and should be explored by distinguishing high income and other income agreements' effects in robustness analysis. There is a greater diversity of agreements among continents, although North America has a substantially greater mean and standard deviation than others. This is due to the fewer countries in North America than Asia and their closer proximity to the US. As proximity may be a key cause of the higher proportion of agreements, using distance as a regressor should address this within the analysis. There are no agreements between the US and Europe, the destination of the majority of FDI and a high proportion of exports and joint ventures, due to political

tensions with the European Union (Smith, 2019). Whilst this may influence results, specific political tensions between high-income countries are likely to be uncorrelated with entry to foreign markets, making this exclusion more randomised (Davis and Meunier, 2011).

Table 4. FTA Summary Statistics

Variables	No.	Mean	SD	Min	Max
Continent^a					
Africa	1	0.02	0.14	0.00	1.00
Asia	6	0.10	0.30	0.00	1.00
Europe	0	0.00	0.00	0.00	0.00
North America	4	0.23	0.42	0.00	1.00
Oceania	1	0.16	0.37	0.00	1.00
South America	3	0.13	0.34	0.00	1.00
Income^b					
Low	0	0.00	0.00	0.00	0.00
Lower-Middle	2	0.04	0.19	0.00	1.00
Upper-Middle	4	0.07	0.25	0.00	1.00
High	9	0.11	0.31	0.00	1.00
Total	15	0.07	0.26	0.00	1.00

Notes: FTA is a binary variable equal to 1 if a free trade agreement between the US and country *i* is in force in year *t*. No. reports the number of partner countries with an agreement in force; Canada and Mexico enter through NAFTA and, subsequently, USMCA. Mean, SD, Min and Max are taken over all country-year observations in the group. ^a Grouped by geographical continent. ^b Determined by the World Bank Income Classification Groups.

In addition to FTA, two key cultural variables will be included to capture the effects of economic and cultural dispersion with the US, given the validated prevalence of their effects. Hofstede's Six Cultural Dimensions will proxy for culture, and a description of each component can be found in Appendix B. This was updated most recently by Minkov and Kaasa (2022) and is the fourth complete expansion since Hofstede (1983). Economic freedom will be proxied by the Heritage Economic Freedom Index, and once again a description of the 12 components of this index can be found in Appendix B (The Heritage Foundation, 2024). Both variables have been shown to be crucial predictors of trade and investment, providing important insights into the integration between countries over time (Arslan et al., 2015; Depken and Sonora, 2005; Stöttinger and Schlegelmilch, 1998).

3.2. Model Control Variables

The key variables will be used in conjunction with two core models; exports will be estimated using the Gravity Trade Model, while FDI and joint ventures using the Knowledge-Capital (KC) extension model. The Gravity Model core theory predicts

bilateral trade flows based on the economic sizes and geographical distance between two countries. This formulation has been extended over time to include variables such as exchange rates in Bergstrand (1985) and economic dispersion indices in Helpman (1987). As geographical distance is less consequential for FDI and joint ventures, the Knowledge-Capital Model was put forward in Ethier and Markusen (1996) to better model these flows. The model considers that horizontal and vertical FDI is homogeneous in country-level FDI data, meaning that a traditional gravity model fails to capture the intricate dynamics of FDI flows. Therefore, it proposes that FDI flows could be modelled by the economic sizes of home and host, the similarity between them, the difference in factor endowments and barriers to investment and trade.

For the Gravity Model, economic sizes will use real GDP at PPP obtained from the World Bank (2022) and geographical distance will be the distance between the US's and each country's respective capital city, obtained from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) gravity dataset (Conte et al., 2022). For the KC Model, economic sizes and similarity are also calculated using real GDP at PPP from the World Bank (2022), factor endowment differences are calculated using real GDP per capita, similarly obtained from the World Bank, and trade openness will use data from the US Census Bureau (2022). Further control variables will be used and explained in the description of Table 2, the data for which were obtained once again from the World Bank and CEPII.

Table 2 presents detailed summary statistics and descriptions of the entire sample of variables. The maximum number of observations in this panel is 3,836, shown for the majority of variables. However, due to zero and negative values for $\ln(\text{OFDI})$ and unreported data for EFI , CD and OFDI , this max figure drops in analysis. These missing observations are intentionally absorbed rather than manipulated to allow direct interpretation of results without disrupting the assumption of normality. This issue is explored further in the methodology section, along with analysis of the unit root values. The kurtosis values have a generally high skew, indicating possible leptokurtic behaviour. This may point to a high presence of outliers for exceptionally large and small countries, meaning the use of country fixed effects will be crucial. Similarly, certain variables such as $\ln(\text{DIST})$ and FTA have significantly low or high skewness, further emphasising the use of country fixed effects. The remaining values are generally within acceptable boundaries and present no issues for further exploration.

4. METHODOLOGY

The methodology used in this paper is primarily motivated by the nature of the data available, specifically factoring that exports and FDI are monetary values while joint ventures is as a count of agreements made. First, the two overarching assumptions of no

unit roots and multicollinearity are assessed. Each variable is tested for a unit root in Table 2; the null of joint non-stationary is rejected for some panel series, but not others, suggesting that a panel cointegration approach, which is usually applied in the case of all non-stationary panel series, is not appropriate. However, as shown in Perron (1989), GDP is particularly susceptible to severe structural breaks which cause unit root tests to fail to reject the null hypothesis. As such, a test incorporating structural breaks, defined in Karavias and Tzavalis (2014), is conducted, including 2009 and 2020 as the structural breaks for the Financial Crash and COVID-19. All GDP-calculated variables reject the null hypothesis at 5% that there is a unit root in their specification, allowing untransformed analysis of them provided that structural breaks are controlled for. Multicollinearity is then assessed in Tables A1, A2 and A3 of Appendix A, where no variables produce high-correlation outcomes.

4.1. Individual - Parametric Estimation

Proceeding first with exports, distance and all variables which are based on monetary values are log normalised to satisfy the linear assumption of normality. Cultural distance requires explicit formulation into an index, and is calculated as a weight of the six dimensions in the same manner as in Kogut and Singh (1988). CD_i represents the overall cultural difference of the i th country and the US, I_{ni} represents the index for the n th cultural dimension and i th country, USI_n the same index for the US, and V_n the overall variance of the index.

$$CD_i = \frac{1}{6} \sum_{n=1}^6 \frac{(I_{ni} - USI_n)^2}{V_n} \quad (1)$$

Each other variable remains untransformed or is transformed as per Table 2. The full equation for exports is subsequently shown in Equation 2.

$$\ln(EXP_{it}) = \beta_0 + \beta_1 FTA_{it} + \beta_2 EFI_{it} + \beta_3 CD_i + \beta_4 A_{it} + \beta_5 X_{it} + \epsilon_{it} \quad (2)$$

EXP_{it} is the value of exports from the US to country i in time t , measured in millions of US\$. FTA_{it} is the key variable of interest, while EFI_{it} and CD_i represent the economic freedom and cultural distance scores of country i from the US. A_{it} is the gravity model matrix of variables, containing $\ln(GDP_{it})$ and $\ln(DIST_i)$. GDP_{it} represents country i 's GDP times US GDP; $GDP_{it} = (GDP_i) * (USGDP_t)$. $DIST_i$ is the geographic distance between the US's and each country's respective capital city. These will be the key reported variables in this model, although a number of controls will also be included, represented by the matrix X_{it} . Finally, $\epsilon_{it} = \alpha_i + \omega_t + v_{it}$, where α_i and ω_t denote the country and time effects that account for unobservable characteristics specific to each country and time period, and v_{it} denotes the idiosyncratic error.

Serial correlation and unobserved heterogeneity are likely to be present in any initial

OLS estimation (Wooldridge, 2020). Therefore, panel fixed effect methods and clustered standard errors are applied immediately to prevent spurious interpretation. A random effects estimation will then be used rather than fixed for two reasons. First is to include the multiple key fixed variables as estimators, particularly distance and cultural distance. By including these, fixed effects are being replicated and controlled for within the model as opposed to instrumented for in a Hausman-Taylor approach (Baltagi et al., 2003). Second is that the observations per unit are relatively small due to the time span (28), meaning that the random effect estimator will tend to produce superior estimates of coefficients as recommended in Clark and Linzer (2015). An initial estimation is made without additional controls followed by a complete variable model, after which a specification which interacts cultural distance with FTA is included followed by one with economic freedom, assessing the interactions of FTAs for different levels of social distance.

FDI uses an adapted specification to factor for the KC model variables. After log normalising the respective variables, Equation 3 presents the model for FDI.

$$\ln(FDI_{it}) = \beta_0 + \beta_1 FTA_{it} + \beta_2 EFI_{it} + \beta_3 CD_i + \beta_4 \mathbf{B}_{it} + \beta_5 \mathbf{X}_{it} + \epsilon_{it} \quad (3)$$

The key variables in this remain unchanged to exports, and $\mathbf{X}_{it}$ once again represents the controls used. $\mathbf{B}_{it}$ replaces matrix $\mathbf{A}$, representing the KC model variables of $\ln(\text{SUMGDP}_{it})$, $\ln(\text{SIM}_{it})$, $\ln(\text{ENDOW}_{it})$ and $\ln(\text{OPEN}_{it})$. SUMGDP_{it} is the sum of US and country i 's GDP, equal to $\text{GDP}_{it} + \text{USGDP}_t$. SIM_{it} captures dispersion between GDP sizes, calculated as $1 - \left(\frac{\text{GDP}_{it}}{\text{GDP}_{it} + \text{USGDP}_t} \right)^2 - \left(\frac{\text{USGDP}_t}{\text{GDP}_{it} + \text{USGDP}_t} \right)^2$ captures factor endowment differences between the US and country i , calculated as the ratio of GDP per capita for country i and the US as performed in Brainard (1997). OPEN_{it} captures the degree of trade openness in the partner country, calculated as $\frac{\text{Exports}_{it} + \text{Imports}_{it}}{\text{GDP}_{it}}$. These variables allow greater distinction of the it type of investment or agreement taking place by capturing dispersions in per capita and overall GDP in similar ways to the cultural distance index.

The method applied to this will be the same as for exports due to the similar nature of the dependent variable data. A random effects estimation will be used immediately, presenting an initial model without additional control variables, a full control model, an interaction with cultural distance and an interaction with economic freedom.

As joint ventures are a count per year, a linear method which log normalises joint ventures is an inappropriate transformation to fulfil key OLS assumptions (O'Hara and Kotze, 2010). Instead, a Poisson method will be applied which assumes a gamma distribution rather than normal. Poisson-distribution models have been shown to be the most efficient for count data due to count variables invariably inflating zero values exponentially (Gardner et al., 1995; Long, 1997). However, a key assumption of Poisson estimation is that the mean and variance of the dependent variable are equal which joint ventures fails to achieve, as shown in Table 2 (Cameron and Trivedi, 2005). As such, a

negative binomial estimation will be applied which accounts for this over dispersion, fitting an additional term ϕ to account for the excess variance (Land et al., 1996). As such, $JVA_{it} \sim \text{Negative Binomial}(\mu_{it}, \phi)$ where μ_{it} is the mean of JVA_{it} and modelled using a logarithmic link function while ϕ is the dispersion parameter. This is formally presented in Equation 4.

$$\ln(E[JVA_{it}|Z_{it}]) = \gamma_0 + \gamma_1 FTA_{it} + \gamma_2 EFL_{it} + \gamma_3 CD_i + \gamma_4 B_{it} + \gamma_5 X_{it} + \alpha_i + \tau_t \quad (4)$$

$E[JVA_{it}|Z_{it}]$ is the expected count of joint venture agreements given the variables in Z_{it} . Similarly to exports and FDI, an initial estimation will be conducted, followed by a full-control estimation and finally ones interacting FTA with cultural distance and economic freedom. One issue with Poisson-distribution methods is the incidental parameter problem (IPP), whereby α_i absorbs not only individual heterogeneity but also part of the variation meant to be explained by the observed variables, creating bias in non-linear models. This may be pervasive given the large number of countries yet low number of time periods being held fixed (Lancaster, 2000). As structural breaks still need to be accounted for following the unit root tests, control variables for the Financial Crash and COVID-19 will be included instead of time fixed effects to prevent unit root bias while minimising the IPP, represented by τ_t (Allison, 2009). This will conclude the individual findings by entry method.

4.2. Comparative - Non-Parametric Estimation

To compare results between methods, an alternative empirical specification will be needed due to the data type differences. One option is the Poisson method which is now frequently applied to gravity-style models of trade and FDI, particularly to address the case of zero values between countries which are eliminated by log-linearising (Arvis and Shepherd, 2013; Krisztin and Fischer, 2015). It would be optimal to apply this to each entry method, though there are a number of issues. First, a number of variables including the dependents show evidence of under or over dispersion, violating the key assumption of a Poisson estimation. Second, given the different data structures of entry methods, a Poisson estimation may fail to capture the nuanced distributions of each variable type to compare effects between them. Therefore, to address both issues, a non-parametric (NP) method will be applied to exports, FDI and joint ventures.

Use of NP methods provides a number of benefits for this dataset. First, NP methods make no assumptions about the variable distributions, allowing untransformed values of FDI and exports to be used which prevents the loss of zero or negative flows. Second, NP methods estimate a specific distribution for the data presented which only depends on the bandwidth plugin, removing issues with making comparisons between data types. There is a modern degree of precedent to using NP methods in entry method flows; Barassi and Zhou (2012) and Gallo et al. (2012) apply them to FDI and exports while Anderson (2022) advocates their theoretical use in gravity trade models.

There are a number of factors to assess in advance to using NP specifications. First is the bandwidth plugin. The most efficient method will be applied which is by minimising the integrated mean squared error (IMSE) of the prediction, although this comes at a trade off of observations by omitting extreme outliers. Gallo et al. (2012) recommended that for variables with mistaken outliers or data errors, the data should be winsorised at 1% and 99%, but for true outliers such as those in FDI, the bandwidth plugin should be moderated. As this is the case, the IMSE is adjusted by a constant factor to balance observation inclusion with overly-linear estimation. Second is the number of missing observations in the dataset. Efromovich (2014) evidenced that missing observations in the dependent variable can bias NP results, particularly if they're not missing completely at random (MCAR). As set out in Section 3.1, 327 outward FDI observations are suppressed at source and are treated here as MCAR on the grounds that suppression depends on the number of investors rather than on the flow itself. The recommendations of Chu and Cheng (1995) and Efromovich (2014) in this scenario are to interpolate and extrapolate missing data using an appropriate method, and as recommended in Greiner (1991) a cubic spline is chosen to retain the distribution smoothness of FDI. Because the spline imputes rather than observes, its use is confined to the non-parametric estimations, where untransformed values are required; the parametric specifications of Section 5.1 use observed outward FDI throughout.

$$Y_{it} = K_h(\mathbf{Z}_{it}) + u_{it} \quad (5)$$

K_h indicates that an Epanechnikov kernel is used, which is known as the most efficient kernel distribution (Epanechnikov, 1969). The kernel function $K_h(x)$ is defined as $K_h(x) = \frac{3}{4h} \left(1 - \left(\frac{Z_{it} - Z_{jt}}{h} \right)^2 \right) \cdot \mathbf{1}_{\left\{ \left| \frac{Z_{it} - Z_{jt}}{h} \right| \leq 1 \right\}}$ where h is the bandwidth, $\mathbf{Z}_{it} - \mathbf{Z}_{jt}$ represents the scaled distances between the predictor variables at specific point i and each other point j , and the indicator function $\mathbf{1}_{\{\cdot\}}$ limits the kernel's influence to within one bandwidth unit from $\mathbf{Z}_{it} - \mathbf{Z}_{jt}$. To assess the interactions conducted in NP analysis, Brunner and Puri (2001) recommended replacing the observed weight with their ranks and treating the resulting data set as heteroskedastic analysis of variance (ANOVA). However, ANOVA models fail to distinguish which groups of variables are significantly different to each other, limiting comparison of the NP interactions. Instead, further NP margin contrast effects will be taken for the proportion of effect of FTAs over the scale of cultural distance and economic freedom. Not only will this indicate whether the effect of FTAs are significantly impacted, it will also allow conclusions to be drawn for different scales of distance and freedom.

4.3. Endogeneity Concerns

There are a number of potential threats to result validity, particularly in omitting zero and negative trade flows, simultaneity between independent and dependent variables,

and aggregation bias through the large and diverse data panel (Bae and Jang, 2013; Islam et al., 2014). The use of untransformed and interpolated values in the non-parametric (NP) analysis compensates for zero flows, removing the need to examine this. However, there is a risk of simultaneity and aggregation in this analysis which will be assessed for robustness.

Simultaneity is possible for a number of variables in this model, key among which being FTA whereby countries with pre-existing export or foreign direct investment (FDI) flows are more likely to form free trade agreements (Baier and Bergstrand, 2007; Egger et al., 2011). In this case, FTA is correlated with the error term which will bias regression results. A lagged dependent variable could be applied at this stage, although this transforms the static model to a dynamic one and exchanges simultaneity bias for dynamic endogeneity whereby the lagged dependent variable is correlated with the error term (Bellemare et al., 2017; Li et al., 2021). This increases the Nickell Bias and, given the relatively small time period compared to number of countries, this may prove consequential (Nickell, 1981).

Therefore, as per the recommendation of Li et al. (2021), the Arellano-Bond System GMM estimator will be applied (Arellano and Bond, 1991). This method is used frequently in trade models to eliminate endogeneity by instrumenting the lagged values for dependent and independent variables, thereby minimising static and dynamic bias. This estimator primarily requires that the panel has $N > T$ states and periods to be efficient due to the increase in moment conditions per time period reducing each instrument's effectiveness, which this study fulfils (Mitze et al., 2010; Kahouli and Omri, 2017). While FTA is the key concern, endogeneity is possible in all the continuous variables used, so time-fixed variables will be treated as exogenous instruments, while all remaining variables will be treated as endogenous and instrumented with appropriately lagged values of the variables in levels (Baltagi, 2005; Saini and Singhanian, 2018). The dependent variables are lagged up to the second level as instruments and the forward orthogonal deviations are transformed rather than differenced for greater instrument efficiency (Phillips, 2019). The resultant difference and level equations for the dynamic model estimation are presented in Equations 6 and 7, where Y_{it} is the dependent entry method variable and Z_{it} is its specific matrix of explanatory variables.

$$\Delta Y_{it} = \delta_1 \Delta Y_{i,t-1} + \delta_2 \Delta Y_{i,t-2} + \beta_1 \Delta Z_{it} + \Delta \epsilon_{it} \quad (6)$$

$$Y_{it} = \gamma_1 Y_{i,t-1} + \gamma_2 Y_{i,t-2} + \alpha_0 + \alpha_1 Z_{it} + \eta_{it} \quad (7)$$

The two-step estimator is used due to this being more asymptotically efficient than one-step for larger sample sizes (Arellano and Bond, 1991; Blundell and Bond, 1995). Nickell illustrated that the inconsistency of dynamic estimation as $N \rightarrow \infty$ is of order $1/T$, equal to 3.6% of the true value in this sample (Nickell, 1981). While this is a significant bias, being below 4% means that analysis can continue with acknowledgement to it.

Aggregation bias - when a grouping of every country into single analysis causes a

loss of information and potentially biased estimates - is particularly likely in this sample due to a high proportion of US free trade agreements being made with high income countries over other income levels. To assess the effect this may have, the sample will be split by income group as per the World Bank classification, then separately estimated with the respective parametric method for Y_{it} previously outlined.

$$Y_{it} = \begin{cases} \beta_0^H + \beta_1^H \mathbf{Z}_{it} + \varepsilon_{it}, & \text{if high-income} \\ \beta_0^L + \beta_1^L \mathbf{Z}_{it} + \varepsilon_{it}, & \text{otherwise} \end{cases} \quad (8)$$

This has been frequently applied to trade models, primarily to assess the effect of FTAs over vertical and horizontal FDI levels through factor endowment differences (Carr et al., 2001; Jang, 2011). This analysis is performed on the individual parametric results rather than non-parametric due to the sensitivity of NP methods to non-random sampling (Cameron and Trivedi, 2005). Given its significance in each specification, the interaction term with cultural distance is also included in the estimations. The results of these robustness specifications should improve the validity of estimates in assessing both parametric and non-parametric results.

5. RESULTS AND DISCUSSION

This section will outline the results of this paper. This will be structured as an individual assessment – parametric estimations of exports, FDI and joint ventures – followed by comparisons – non-parametric estimations – and then reviewing the impact of endogeneity.

5.1. Individual Results – Parametric

Table 5 reports results for the fixed effects panel methods applied to exports and FDI, along with the additional estimations interacting cultural distance and economic freedom with FTA. Important coefficients such as GDP and distance all show the expected signs and magnitude with a high R-squared present throughout. The additional controls add explanatory power even while reducing the number of observations, supporting their usage. First looking at (1) and (2), whilst there is a strong positive relationship between free trade agreements (FTAs) and exports, the standard error is high enough to make this insignificant at 10%. This is not uncommon; for the case of Japan, Yamanouchi (2019) came to a similar conclusion once fixed effects were included in the analysis. However, given the significance of other variables and strong backing for a positive effect, the interactions seem crucial to analysis. Both interaction terms are significant at 10% and have opposite signs, supporting the conclusion that with an FTA in force, greater

cultural distance or lower economic freedom increase the volume of exports from the US. In (4), FTA is also significant at 5% and has a strong positive effect on export levels.

The effect of cultural distance on exports has little empirical consensus, with results depending on a number of intrinsic factors like the exporting country. One issue is the difficulty in quantifying culture, with studies using a variety of metrics other than the commonly used Hofstede dimensions to capture it (Felbermayr and Toubal, 2010). However, these results are consistent with those of Liu et al. (2021) which also studied the US, finding that greater cultural distance led to higher export levels from the reduced human contact needed in exporting. A point of interest is that FTA remains insignificant when the interaction with CD is included. Liu et al. (2021) highlighted the importance of industry type in their analysis, finding stronger negative effects for manufactured goods over primary resources due to the human interaction differences required. As a highly developed economy, this may be an important explanation for the US with there being relatively fewer exports of primary goods.

The results for economic freedom are more conclusive. An FTA in place leads to a 163% increase in exports, reduced by 2.1% for every point increase in economic freedom, which implies that a country with a freedom score over 78 will not benefit through US imports from an FTA. Without an FTA, economic freedom has a positive effect on exports, something to be expected from similar studies of the US (Depken and Sonora, 2005). This difference might be a result of the stability and improved trade relationship which an FTA provides, limiting the benefit for high-income countries with a prior trade relationship. Whilst the conflicting results around culture leave the effects open to further interpretation, the finding of a highly positive effect of FTAs on exports when the interaction with economic freedom is included is as expected and consistent with the literature for US agreements (Gould, 1998; España, 1993). For the results in FDI, the key coefficients in the knowledge-capital model – SUMGDP, SIM, ENDOW and OPEN – all show the expected signs and magnitude throughout the models. ENDOW fails to be significant without interaction terms which could be due to the horizontal and vertical FDI effects coinciding. Likewise, cultural distance is significant in (1) but not (2), perhaps implying omitted variable bias initially without other controls. As with exports, FTA is initially insignificant in (1) and (2), implying a possible relationship with other variables in the model. Once interactions with cultural distance and economic freedom were included, all FTA results become significant to at least the 10% level.

The key result for FDI is the inverse relationship between cultural distance and FDI in (3), as would be expected for the greater human involvement needed with the recipient country. All countries above the mean (1.89) of cultural distance would not benefit from an FTA coming into force. The negative impact of cultural distance supports other empirical findings such as those of Helpman et al. (2004) and Kandogan (2016), and the coefficient remains negative irrespective of an FTA being in place. While FTA has a positive coefficient, only very culturally similar countries to the US receive this benefit.

Table 5. Random Effects Results – Exports and FDI

Variables	Export				FDI			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
ln(GDP)	0.965*** (0.078)	0.920*** (0.073)	0.912*** (0.073)	0.916*** (0.073)				
ln(DIST)	-1.254*** (0.230)	-1.066*** (0.190)	-1.082*** (0.179)	-1.054*** (0.188)				
ln(SUMGDP)					2.674*** (0.874)	2.508*** (0.789)	2.322*** (0.733)	2.517*** (0.788)
ln(SIM)					1.020*** (0.149)	1.099*** (0.141)	1.117*** (0.136)	1.100*** (0.141)
ln(ENDOW)					0.326 (0.235)	0.323 (0.226)	0.372* (0.220)	0.323 (0.228)
ln(OPEN)					0.357*** (0.088)	0.359*** (0.086)	0.368*** (0.086)	0.368*** (0.087)
EFI	0.001 (0.005)	0.006* (0.003)	0.006* (0.003)	0.007* (0.003)	0.013 (0.009)	0.013 (0.009)	0.011 (0.008)	0.011 (0.009)
CD	-0.360*** (0.133)	-0.253** (0.108)	-0.269** (0.108)	-0.251** (0.107)	-0.451** (0.200)	-0.293 (0.203)	-0.226 (0.221)	-0.295 (0.204)
FTA	0.154 (0.120)	0.140 (0.124)	-0.161 (0.209)	1.634** (0.830)	-0.144 (0.246)	-0.215 (0.247)	0.964** (0.390)	-2.412* (1.238)
FTA × CD			0.162* (0.086)				-0.635*** (0.170)	
FTA × EFI				-0.021* (0.011)				0.031** (0.016)
Constant	-7.833*** (2.883)	-8.846*** (2.408)	-8.530*** (2.374)	-8.913*** (2.387)	-30.690** (14.330)	-20.180 (12.780)	-17.910 (12.110)	-20.160 (12.800)
Observations	3,208	2,762	2,762	2,762	2,762	2,762	2,762	2,762
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (X)	No	Yes	Yes	Yes	No	Yes	Yes	Yes
R-squared	0.723	0.807	0.808	0.808	0.742	0.771	0.764	0.773
RMSE	0.427	0.342	0.341	0.341	0.695	0.694	0.688	0.693

Notes: The dependent variable is the natural logarithm of US exports to country i in year t in the four Exports columns and the natural logarithm of US outward FDI in the four FDI columns, both measured in millions of US dollars. GDP is the product of US and partner GDP, DIST the distance between capital cities, SUMGDP the sum of US and partner GDP, SIM GDP similarity, ENDOW relative factor endowments and OPEN partner trade openness. EFI is the Heritage Index of Economic Freedom score, CD the cultural distance index and FTA a binary equal to 1 when a free trade agreement is in force. Controls (X) are the other control variables listed in Table 2. Estimated by random effects with year dummies; standard errors are clustered by country and given in parentheses. One, two, and three stars denote significance at the 10%, 5%, and 1% levels, respectively.

Once again, the results are inverted in (4) whereby FTA has a negative coefficient and its interaction with economic freedom a positive one. This relationship means the interaction turning point score is the same for exports, whereby a freedom score of 78 or higher will turn the effect of an FTA positive on FDI. This supports the inherent link between them as entry methods to foreign markets, and means that a large proportion of countries which are below this score experience a negative impact from FTAs (Helpman et al., 2004). The positive effects of economic freedom on FDI are heavily supported;

both Ghazalian and Amponsem (2019) and Tag and Degirmen (2022) found similar positive effects on FDI flows using the same Heritage freedom scores as are employed here. These results provide further evidence towards the importance of economic freedom and cultural difference in determining the effect of FTAs.

Table 6 presents the findings for the negative binomial method applied to joint ventures with similar additional interaction terms for cultural distance and economic freedom in (3) and (4). Coefficients are reported as exponentiation incidence rate ratios for ease of interpretation and standard errors are bootstrapped for greater accuracy. SUMGDP, SIM and OPEN are positive and significant as for FDI yet ENDOW fails to be significant in any specification, supporting the economic link between joint ventures and FDI. CD is significant without controls in (1) and fails to be significant after, perhaps implying similar bias to FDI though an identical result may substantiate that endogeneity is initially present. Aside from this, all variables have the expected signs, and FTA is significant and positive at the 10% level in (2). This indicates it has a standalone positive effect on the percentage chance of joint ventures, contrary to FDI.

Despite the foundations for the effect of culture on ventures, neither FTA nor the interaction with cultural distance are significant in (3). Due to the more complex nature of joint venture agreements over FDI and export funding, this may be due to omitted variable bias of unobservable human factors. The McFadden R-squared values could support this due to the lower values than exports and FDI. Additionally, joint ventures may be heavily influenced by different measurements of culture to Hofstede's dimensions. Both Ozorhon et al. (2008) and Arslan et al. (2015) found that national culture had no impact on the rate of agreements, instead highlighting the importance of individual organisational culture in the decision process. Nevertheless, these values are consistent with those of Kogut and Singh (1988) and Tihanyi et al. (2005), not only producing higher R-squared values but also showing similar negative signs for cultural distance.

However, the interaction with economic freedom is significant to 10% along with FTA. Arslan et al. (2015) once again came to the same conclusion, its implication being that FTAs only encourage joint ventures if the recipient country has a high degree of freedom. Unlike exports and FDI, economic freedom and cultural distance are This may highlight the importance of economic stability over cultural dimensions when it comes to free trade agreements with joint ventures. The conclusion which can be drawn, however, is that the effects of FTAs on joint venture agreements are heavily dependent on economic freedom, though the negative coefficients are similar to the results of FDI.

Taken together, two outcomes become clear. First, all methods depend on the economic and cultural differences between the US and the recipient country. Second, the ambiguous signs depending on the interaction terms support the use of a further non-parametric (NP) estimation to more accurately define the distribution. However, it seems that FTAs do provide positive effects for encouraging entry into foreign markets; a higher economic freedom or lower cultural difference incentivises equity and partnership methods, while lower freedom and greater differences encourages exporting.

Table 6. Negative Binomial Results – Joint Ventures

Variables	(1)	(2)	(3)	(4)
ln(SUMGDP)	10.620*** (1.106)	6.315*** (1.169)	6.376*** (1.189)	6.246*** (1.131)
ln(SIM)	1.861*** (0.256)	1.539** (0.323)	1.555** (0.317)	1.516* (0.329)
ln(ENDOW)	1.328 (0.274)	1.275 (0.494)	1.284 (0.496)	1.283 (0.526)
ln(OPEN)	1.287*** (0.092)	1.263* (0.163)	1.258* (0.166)	1.301** (0.174)
EFI	1.025 (0.018)	1.007 (0.019)	1.007 (0.019)	1.003 (0.020)
CD	0.802** (0.084)	0.881 (0.141)	0.861 (0.141)	0.881 (0.135)
FTA	1.335 (0.349)	1.564* (0.386)	1.169 (0.723)	0.064* (0.107)
FTA × CD			1.195 (0.456)	
FTA × EFI				1.045* (0.024)
Observations	3,208	2,762	2,762	2,762
Crash / COVID Controls	Yes	Yes	Yes	Yes
Controls (X)	No	Yes	Yes	Yes
McFadden R-squared	0.197	0.238	0.239	0.239
Log Likelihood	-1736	-1646	-1645	-1644

Notes: The dependent variable is the annual count of joint venture agreements between US firms and country *i*. Coefficients are reported as incidence rate ratios (e^{β_k}), so a value above 1 indicates a positive effect. GDP is the product of US and partner GDP, DIST the distance between capital cities, SUMGDP the sum of US and partner GDP, SIM GDP similarity, ENDOW relative factor endowments and OPEN partner trade openness. EFI is the Heritage Index of Economic Freedom score, CD the cultural distance index and FTA a binary equal to 1 when a free trade agreement is in force. Controls (X) are the other control variables listed in Table 2. Estimated by random effects with Financial Crash and COVID-19 dummies in place of year fixed effects; bootstrapped standard errors are given in parentheses. One, two, and three stars denote significance at the 10%, 5%, and 1% levels, respectively.

5.2. Comparative Results – Non-Parametric

Having confirmed the effects of FTAs individually, Table 7 provides results for the non-parametric specifications used to compare between entry methods. These specifications use the interpolated outward FDI series described in Section 3.1, acting as the dependent variable in the FDI column and a control in the exports and joint venture columns. The bandwidth row shows the constant multiplier to the integrated plugin and the mean row the mean effect of each entry method. By allowing the estimator to determine the relationship between variables rather than assume linearity, each model produces a higher degree of fit and greater significance for each variable. Initial analysis confirms that FTAs have a positive effect on exports and a negative effect on FDI and

joint ventures, but this negative effect is greater for joint ventures and pushes the mean to negative. Overall, there is a 65% increase in exports, a 74% fall in FDI and a 193% fall in joint ventures, based on deviation from the mean effect. Because the FDI series is partly imputed, its magnitude is better read as indicative than as a point estimate; the sign, and its stability across the range of cultural distance in Figure 2, are the more reliable features and are what the comparison between methods creates. This is similar to the results of the parametric interaction specifications, though to compare these, replications of the interaction terms must be tested. Therefore, Figure 2 presents the contrast plot of the effects of FTAs for each method over cultural distance and Figure 3 over economic freedom.

Figure 2 confirms the earlier findings for the sensitivity of entry method to cultural distance. The effect of FTAs becomes less detrimental for joint ventures as cultural distance increases, while exports in particular sees less benefit as distance reaches the max value. One reason behind this may be that these methods are substitutable for firms by country; the introduction of an FTA may encourage exporting due to the reduced trade costs and better national relationship at the expense of conducting joint ventures. FDI is consistently negative, an effect which may speak to the type of FDI which is dominant. It has been found that horizontal FDI – FDI between similarly endowed economies – has a substitution relationship with exports and is negatively affected by FTAs, while vertical FDI has a complementary and opposite relationship (Lankhuizen et al., 2011; Bricongne et al., 2023). This supports the high-income bias of US entries shown in Table 3 and speaks to the dominance of horizontal FDI over vertical in the US. Despite this, the values remain relatively consistent over the spectrum of cultural distance. Figure 3 is more nuanced, though still supports the effects of cultural distance. In particular, FTAs are beneficial to joint ventures if economic freedom is below 30, contradicting the parametric results in Table 6. One explanation for this may be that the NP specification more efficiently captures the distribution of joint ventures, meaning that these results are likely to have less bias (Parman and Featherstone, 2019). This may support the notion that methods act as substitutes rather than complements; exports and FDI run parallel to each other, diverging around a similar score of 30 where FTAs become very beneficial to exports (Bricongne et al., 2023). Extrapolating this, FTAs encourage joint ventures with economically restrictive countries then support exports for countries with greater freedom. Javorcik and Saggi (2010) highlighted the importance of profit sharing in a joint venture, citing it as a key determinant in the trade off of partnerships versus direct entry. This may be the case here, whereby US firms may wield greater negotiating power over profits in economically restrictive countries. These results once again reaffirm the dependency of FTAs on the economic freedom of the recipient country.

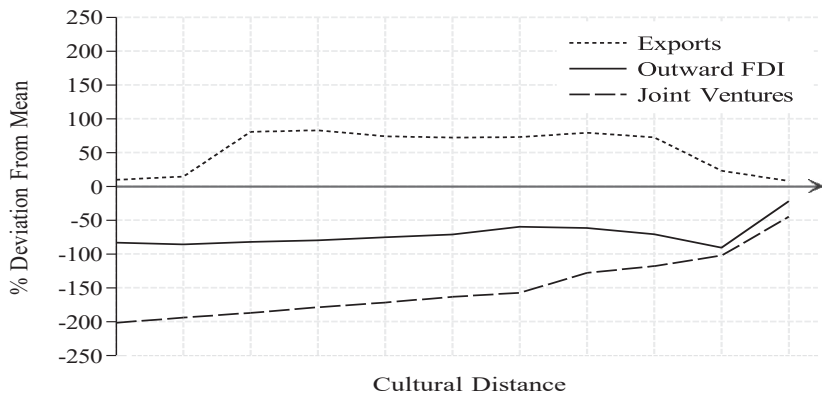
Therefore, while the parametric individual results may indicate that FTAs are detrimental to the spectrum of foreign market entry, these results suggest otherwise through the relationship between them. Figures 2 and 3 highlight that, for the case of the US, methods are substitutes rather than complements, as is the case in Lankhuizen et al.

(2011) and Bricongne et al. (2023). FTAs shift the method of entry rather than hindering them, yet the results are heavily dependent on the cultural dynamics of the partner country. This evidence does suggest that FTAs positively affect exports the most and joint ventures the least.

Table 7. Combined Non-Parametric Results

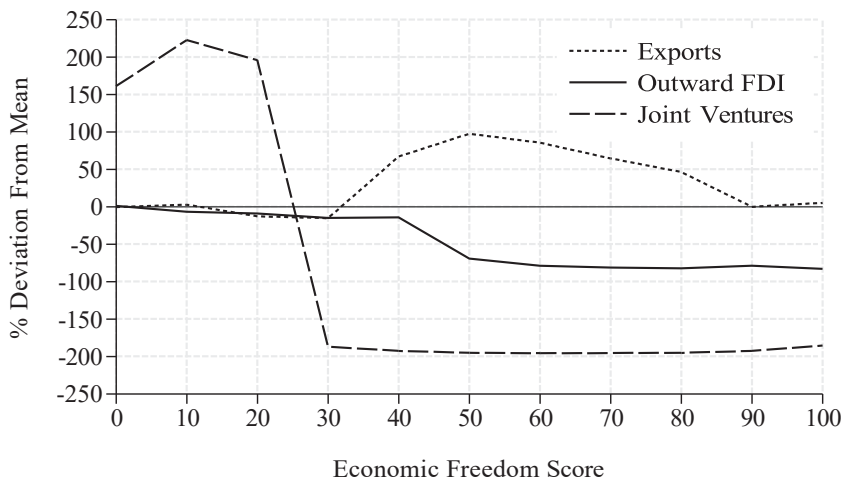
Variables	Exports	FDI	Joint Ventures
ln(GDP)	3,299*** (165)		
ln(DIST)	-1,143 (716)		
ln(SUMGDP)		36,509*** (5,758)	2.847*** (0.686)
ln(SIM)		21,087*** (1,321)	0.269*** (0.033)
ln(ENDOW)		-1,509 (1,526)	-0.250*** (0.064)
OPEN		201,662*** (42,421)	3.016*** (0.950)
EFI	-77*** (22)	1,424*** (189)	-0.011 (0.008)
CD	829*** (204)	-1,743 (1,696)	0.814*** (0.042)
FTA	7,313*** (945)	-21,996*** (3,596)	-1.556*** (0.118)
Mean	11,148*** (445)	29,686*** (1,993)	0.805*** (0.119)
Observations	2,840	3,127	3,151
Controls (X)	Yes	Yes	Yes
Bandwidth	1.125	1.750	0.550
R-squared	0.990	0.733	0.406

Notes: Non-parametric estimates using an Epanechnikov kernel. The dependent variables are the untransformed values of US exports and outward FDI in millions of US dollars and the annual count of joint venture agreements. All three columns rest in part on S(OFDI), the cubic-spline interpolated series defined in Table 2: it is the dependent variable in the FDI column and enters the exports and joint venture models as a control. Interpolated values are not equivalent to directly observed data. Because exports and FDI are in levels while joint ventures are a count, the first two columns are reported to the nearest unit and the third to three decimal places. Bandwidth is the constant multiplier applied to the integrated plugin and Mean the mean effect for each entry method. GDP is the product of US and partner GDP, DIST the distance between capital cities, SUMGDP the sum of US and partner GDP, SIM GDP similarity, ENDOW relative factor endowments and OPEN partner trade openness. EFI is the Heritage Index of Economic Freedom score, CD the cultural distance index and FTA a binary equal to 1 when a free trade agreement is in force. Controls (X) are the other control variables listed in Table 2. Bootstrapped standard errors are given in parentheses. One, two, and three stars denote significance at the 10%, 5%, and 1% levels, respectively.



Notes: Non-parametric margin contrast effects showing the percentage change in each entry method associated with a free trade agreement in force, expressed as a deviation from that method’s mean effect in Table 7, across the range of the cultural distance index. Cultural distance takes values between 0.08 and 4.20 with a sample mean of 1.89 (Table 2). Estimated with an Epanechnikov kernel over the 137-country panel, 1995-2022.

Figure 2. FTA % Change By Cultural Distance



Notes: Non-parametric margin contrast effects showing the percentage change in each entry method associated with a free trade agreement in force, expressed as a deviation from that method’s mean effect in Table 7, across the Heritage Index of Economic Freedom score. The score runs from 0 to 100, with a sample mean of 61.03 (Table 2). Estimated with an Epanechnikov kernel over the 137-country panel, 1995-2022.

Figure 3. FTA % Change By Economic Freedom Score

5.3. Endogeneity Concerns

Table 8. Combined GMM Results

Variables	Exports	FDI	Joint Ventures
$Y_{i,t-1}$	0.849*** (0.049)	0.900*** (0.044)	1.818*** (0.164)
$Y_{i,t-2}$	-0.072 (0.046)	0.017 (0.041)	-0.047 (0.195)
$\ln(\text{GDP})$	0.115*** (0.042)		
$\ln(\text{DIST})$	-0.173** (0.068)		
$\ln(\text{SUMGDP})$		0.038 (0.069)	-0.519 (0.581)
$\ln(\text{SIM})$		0.114 (0.074)	-3.947*** (1.273)
$\ln(\text{ENDOW})$		-0.113 (0.127)	3.746* (2.001)
$\ln(\text{OPEN})$		0.132* (0.070)	-1.208** (0.547)
EFI	0.003 (0.003)	0.009** (0.004)	-0.036 (0.059)
CD	-0.014 (0.016)	-0.033 (0.036)	-0.333 (0.649)
FTA	0.127** (0.057)	-0.079 (0.093)	2.490 (1.624)
Constant	-0.421 (0.445)	0.069 (1.203)	-16.477 (21.423)
Observations	2,596	2,398	2,598
Controls (X)	Yes	Yes	Yes
Hansen J-Stat. p-value	1.000	0.379	0.662
AR (1) Test p-value	0.009	0.000	0.081
AR (2) Test p-value	0.415	0.567	0.444

Notes: Two-step Arellano-Bond System GMM estimates. $Y_{i,t-1}$ and $Y_{i,t-2}$ are the first and second lags of the dependent entry method variable. GDP is the product of US and partner GDP, DIST the distance between capital cities, SUMGDP the sum of US and partner GDP, SIM GDP similarity, ENDOW relative factor endowments and OPEN partner trade openness. EFI is the Heritage Index of Economic Freedom score, CD the cultural distance index and FTA a binary equal to 1 when a free trade agreement is in force. Controls (X) are the other control variables listed in Table 2. The Hansen J-statistic tests instrument validity and AR(1) and AR(2) test for first and second order serial correlation. Standard errors are clustered by country and Windmeijer bias-corrected, and are given in parentheses. One, two, and three stars denote significance at the 10%, 5%, and 1% levels, respectively.

Table 8 presents the simultaneity specification results along with Hansen J-Statistic and autocorrelation p-values for assumption testing. The Hansen statistics confirm that there are not too many instruments used, failing to reject the null hypothesis which supports the structural specification (Roodman, 2009). Furthermore, all specifications show evidence of serial correlation at the first order but not the second at 10%

significance, thus fulfilling the required assumptions for GMM (Cameron and Trivedi, 2005). All standard errors are reported as clustered by country, and robust and bias adjusted as per Windmeijer (2005).

The gravity variables and key variable FTA are all significant at 5% for exports. While the magnitude of the coefficients fall for these variables, there are no unexpected sign changes which would be indicative of bias in the original specification. FTA in particular is significant without the interaction with economic freedom, a notable result supporting previous literature. FDI only has two significant common variables, OPEN and EFI. Once again, both these variables have a smaller magnitude than the previous specification but have the same signs which is promising. Finally, joint ventures show differences to its previous specification, particularly for OPEN and SIM. While this may indicate bias in the previous specification, one reason may be due to the linear estimation method of GMM. A negative binomial GMM specification may therefore be more applicable to test endogeneity, although this method is beyond the scope of this study for certifying robustness. What can be concluded is the significance of SIM and OPEN, two similarly significant variables in Table 6. Furthermore, ENDOW is now significant with the same sign as in Table 6. As these are the key significant variables in the previous estimation, it can be suggested that joint ventures along with exports and FDI have a considerable enough lack of endogeneity to keep the original conclusions robust.

Table 9 reports the results for aggregation bias. Splitting the sample produces nearly equal population sizes with similar R-squared values for each entry method, and while some variables are significant within both populations, many are only significant within one income group. However, there are no unexpected sign changes in doing so. Focusing on FTA in exports, only lower income countries show significance at 5% for the effects of FTAs. Additionally, its interaction with cultural distance is also more significant and impactful for lower income countries than higher. FDI shows an opposite impact; FTA and $FTA \times CD$ are only significant for high income countries with a higher magnitude of effect. Finally, neither sample produces significant estimates for FTA or $FTA \times CD$ for joint ventures. This aligns to the initial negative binomial results, and the magnitude and signs remain similar to this. While significance varies by income level, there fails to be a change in sign of any effect which would indicate that initial results were spurious. Homogenising therefore is seen to adequately capture these effects while eliminating any Simpson's Paradox² introduced in sample splitting. Combined with the supportive results of Table 8, it can be evidenced that the earlier results and conclusions remain robust to alternative specifications and sensitivities.

². Phenomenon in which a trend appears in several groups of data but disappears or reverses when the groups are combined (Simpson, 1951).

Table 9. Combined Sensitivity Analysis of Income Level

Variables	Exports		FDI		Joint Ventures	
	Low	High	Low	High	Low	High
ln(GDP)	0.876*** (0.081)	1.055*** (0.108)				
ln(DIST)	-1.456*** (0.279)	-0.389* (0.200)				
ln(SUMGDP)			2.677*** (0.900)	3.050 (2.566)	7.207*** (4.136)	4.152*** (1.347)
ln(SIM)			1.061*** (0.146)	1.312*** (0.310)	1.687 (0.619)	2.640*** (0.533)
ln(ENDOW)			0.645** (0.303)	-0.404 (0.377)	2.285 (1.440)	1.714 (0.630)
ln(OPEN)			0.392*** (0.094)	0.106 (0.148)	1.624* (0.456)	1.084 (0.219)
EFI	0.005 (0.004)	0.012** (0.006)	0.002 (0.009)	0.028* (0.016)	1.006 (0.037)	1.024 (0.017)
CD	-0.206* (0.125)	-0.090 (0.233)	0.079 (0.254)	0.068 (0.395)	0.825 (0.252)	1.318 (0.254)
FTA	-0.850** (0.401)	-0.134 (0.179)	-0.010 (0.256)	0.877* (0.501)	1.001 (12.082)	1.213 (1.008)
FTA × CD	0.614*** (0.218)	0.092* (0.051)	-0.107 (0.120)	-0.614*** (0.194)	1.421 (8.954)	1.133 (0.510)
Constant	-4.285* (2.551)	-19.334*** (3.889)	-22.761 (14.394)	-34.486 (41.660)		
Observations	1,562	1,200	1,562	1,200	1,562	1,200
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls (X)	Yes	Yes	Yes	Yes	Yes	Yes
Country No.	69	47	69	47	69	47
R-squared /McFadden	0.823	0.785	0.740	0.674	0.268	0.411

Notes: The sample is split by World Bank income classification, with High denoting high-income countries and Low all others. Exports and FDI are estimated by the panel method of Table 5 and joint ventures by the negative binomial method of Table 6, whose coefficients are incidence rate ratios and therefore have no constant term. GDP is the product of US and partner GDP, DIST the distance between capital cities, SUMGDP the sum of US and partner GDP, SIM GDP similarity, ENDOW relative factor endowments and OPEN partner trade openness. EFI is the Heritage Index of Economic Freedom score, CD the cultural distance index and FTA a binary equal to 1 when a free trade agreement is in force. Controls (X) are the other control variables listed in Table 2. Standard errors are clustered by country for exports and FDI and bootstrapped for joint ventures, and are given in parentheses. One, two, and three stars denote significance at the 10%, 5%, and 1% levels, respectively.

6. CONCLUDING REMARKS

In this paper, the relationship of FTAs with a spectrum of entry methods are

empirically examined which, when directly compared, provide insight into the effects which FTAs have on US firms. This study focuses on the US to provide insight into the key global source of multinational firms yet with FTAs with diverse economic backgrounds. These effects have been ambiguous in the literature to date, and whether FTAs promote or hinder foreign market entry has remained an unconcluded area of study.

Linear and non-linear panel methods are initially applied to estimate individual effects, indicating that FTAs prove beneficial for exporting and detrimental for investing and partnering. However, this depends on the cultural and economic differences between the two countries, with effects changing sign along the range of difference. A non-parametric method is then applied to provide comparison between methods, reaching similar conclusions. Low economic freedom favours the use of joint ventures, higher freedom scores suggest that firms export while FTAs provide limited benefit to FDI regardless of freedom. Endogeneity is then assessed for these results using a GMM specification for reverse causality and sample splits over country income level for aggregation bias. The outcomes provide evidence that the primary results are consistent to empirical flaws and can be reliably interpreted, though care should still be taken in directly interpreting these results.

There are numerous potential policy implications for this, particularly in the formulation of FTAs. While economic variables remain crucial in decision making, the key result of this paper is the impact of inherent cultural factors of each country on behaviour. To fully maximise the potential benefit of an FTA, the recipient country must be evaluated in multiple scopes outside of political and economic relationships for US firms to most benefit. Furthermore, additional care should be taken to provide extra provisions for encouraging investment and partnerships, particularly for socially distant countries. This should be evaluated in the context of the predominant type of investment, whether that be horizontal or vertical, to provide the greatest impact. These outcomes indicate that policymakers should encourage further provisions towards investment with carefully selected countries over existing trade encouragement. As the comparative FDI estimates rest partly on interpolated observations, this is offered as a direction of travel rather than a calibrated magnitude.

While a number of endogeneity risks have been investigated, three key limitations are worth highlighting which could be expanded upon in future research. First is the limited time period of the panel and sole application to the US; extending this time period and applying the methods to other countries' viewpoints could provide a more nuanced view of firms with different behaviours to the US. In particular, a cross section of countries at different development points would provide additional perspectives of the effects, not only ratifying the conclusions drawn here but also providing results which are globally applicable. Second, given that cultural and economic differences between countries were shown to be crucial determinants, expanding the variety of cultural variables could provide further insight into this important conclusion and narrow any primary impacting factors. Applying the framework of this paper to a wider variety of

host countries and cultural variables would provide greater evidence for the important relationship between FTAs and the way firms enter foreign markets. Finally, outward FDI is not fully observed. Suppression at source affects 8.5% of country-year cells, which are recovered by interpolation for the non-parametric comparison. The affected positions are small and the parametric results do not use them, so the direction of the findings is unaffected, but the comparative FDI magnitudes are imputed in part and would be sharpened by access to the underlying confidential data.

APPENDIX A

This appendix lists the supporting tables to this paper's analysis, comprising the correlation matrices for each entry method in Tables A1, A2 and A3, the list of US BITs and their dates in Table A4, and the total list of countries which are analysed in Table A5.

Table A1. Correlation Matrix for Export Model

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) ln(GDP)	1.00													
(2) ln(DIST)	0.09	1.00												
(3) EFI	0.12	-0.16	1.00											
(4) CD	-0.14	0.06	-0.37	1.00										
(5) FTA	0.19	-0.18	0.21	-0.13	1.00									
(6) ln(ENDOW)	0.35	-0.22	0.56	-0.24	0.16	1.00								
(7) ln(OFDI)	0.62	-0.23	0.42	-0.33	0.21	0.59	1.00							
(8) JVA BIN	0.50	0.02	0.22	-0.21	0.18	0.25	0.46	1.00						
(9) ln(ER)	0.01	0.22	-0.27	0.12	-0.09	-0.42	-0.24	-0.08	1.00					
(10) DEFICIT	0.28	0.09	-0.01	0.00	-0.06	0.09	0.08	0.10	0.05	1.00				
(11) LOCK	-0.20	0.14	-0.12	0.02	-0.14	-0.22	-0.23	-0.15	0.14	-0.02	1.00			
(12) INTERNET	0.37	-0.13	0.34	-0.14	0.18	0.46	0.37	0.29	-0.17	0.02	-0.06	1.00		
(13) BIT	-0.06	-0.06	0.01	0.19	-0.01	-0.11	-0.29	-0.15	-0.04	-0.05	0.06	0.01	1.00	
(14) COMLANG	-0.20	0.01	0.07	-0.31	0.04	-0.16	0.04	0.04	-0.11	-0.08	-0.10	-0.09	-0.23	1.00

Notes: Pairwise correlation coefficients for the variables entering the export model of Equation 2. Column headings correspond to the numbered variables in the first column. Coefficients are reported to two decimal places; variable definitions are given in Table 2.

Table A2. Correlation Matrix for FDI Model

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ln(SUMGDP)	1.00														
(2) ln(SIM)	0.18	1.00													
(3) ln(ENDOW)	0.10	0.36	1.00												
(4) ln(OPEN)	0.01	0.09	0.42	1.00											
(5) EFI	0.09	0.10	0.56	0.47	1.00										
(6) CD	-0.03	-0.16	-0.24	-0.20	-0.37	1.00									
(7) FTA	0.14	0.16	0.16	0.26	0.21	-0.13	1.00								
(8) ln(DIST)	0.01	0.09	-0.22	-0.47	-0.16	0.06	-0.18	1.00							
(9) JVA BIN	0.33	0.44	0.25	0.20	0.22	-0.21	0.18	0.02	1.00						
(10) ln(ER)	0.06	-0.01	-0.42	-0.24	-0.27	0.12	-0.09	0.22	-0.08	1.00					
(11) DEFICIT	0.04	0.31	0.09	0.15	-0.01	0.00	-0.06	0.09	0.10	0.05	1.00				
(12) LOCK	-0.04	-0.22	-0.22	-0.36	-0.12	0.02	-0.14	0.14	-0.15	0.14	-0.02	1.00			
(13) INTERNET	0.60	0.18	0.46	0.17	0.34	-0.14	0.18	-0.13	0.29	-0.17	0.02	-0.06	1.00		
(14) BIT	0.03	-0.08	-0.11	-0.14	0.01	0.19	-0.01	-0.06	-0.15	-0.04	-0.05	0.06	0.01	1.00	
(15) COMLANG	-0.01	-0.22	-0.16	0.09	0.07	-0.31	0.04	0.01	0.04	-0.11	-0.08	-0.10	-0.09	-0.23	1.00

Notes: Pairwise correlation coefficients for the variables entering the FDI model of Equation 3. Column headings correspond to the numbered variables in the first column. Coefficients are reported to two decimal places; variable definitions are given in Table 2.

Table A3. Correlation Matrix for Joint Ventures Model

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ln(SUMGDP)	1.00														
(2) ln(SIM)	0.18	1.00													
(3) ln(ENDOW)	0.10	0.36	1.00												
(4) ln(OPEN)	0.01	0.09	0.42	1.00											
(5) EFI	0.09	0.10	0.56	0.47	1.00										
(6) CD	-0.03	-0.16	-0.24	-0.20	-0.37	1.00									
(7) FTA	0.14	0.16	0.16	0.26	0.21	-0.13	1.00								
(8) ln(DIST)	0.01	0.09	-0.22	-0.47	-0.16	0.06	-0.18	1.00							
(9) ln(OFDI)	0.24	0.61	0.59	0.53	0.42	-0.33	0.21	-0.23	1.00						
(10) ln(ER)	0.06	-0.01	-0.42	-0.24	-0.27	0.12	-0.09	0.22	-0.24	1.00					
(11) DEFICIT	0.04	0.31	0.09	0.15	-0.01	0.00	-0.06	0.09	0.08	0.05	1.00				
(12) LOCK	-0.04	-0.22	-0.22	-0.36	-0.12	0.02	-0.14	0.14	-0.23	0.14	-0.02	1.00			
(13) INTERNET	0.60	0.18	0.46	0.17	0.34	-0.14	0.18	-0.13	0.37	-0.17	0.02	-0.06	1.00		
(14) BIT	0.03	-0.08	-0.11	-0.14	0.01	0.19	-0.01	-0.06	-0.29	-0.04	-0.05	0.06	0.01	1.00	
(15) COMLANG	-0.01	-0.22	-0.16	0.09	0.07	-0.31	0.04	0.01	0.04	-0.11	-0.08	-0.10	-0.09	-0.23	1.00

Notes: Pairwise correlation coefficients for the variables entering the joint venture model of Equation 4. Column headings correspond to the numbered variables in the first column. Coefficients are reported to two decimal places; variable definitions are given in Table 2.

Table A4. List of Bilateral Investment Treaties for the USA

Agreement ^a	Date of Signature	Date into Force	Agreement ^a	Date of Signature	Date into Force
Albania	Jan-95	Jan-98	Kazakhstan	May-92	Jan-94
Argentina	Nov-91	Oct-94	Kyrgyzstan	Jan-93	Jan-94
Armenia	Sep-92	Mar-96	Latvia	Jan-95	Nov-96
Azerbaijan	Aug-97	Aug-01	Lithuania	Jan-98	Nov-01
Bahrain	Sep-99	May-01	Moldova	Apr-93	Nov-94
Bangladesh	Mar-86	Jul-89	Mongolia	Oct-94	Jan-97
Bolivia ^b	Apr-98	Jun-01	Morocco	Jul-85	May-91
Bulgaria	Sep-92	Jun-94	Mozambique	Dec-98	Mar-05
Cameroon	Feb-86	Apr-89	Panama	Oct-82	May-91
Democratic Republic of Congo	Aug-84	Jul-89	Poland	Mar-90	Aug-94
Croatia	Jul-96	Jun-01	Romania	May-92	Jan-94
Czechia	Oct-91	Dec-92	Rwanda	Feb-08	Jan-12
Ecuador ^c	Aug-93	May-97	Senegal	Dec-83	Oct-90
Egypt	Mar-86	Jun-92	Slovakia	Oct-91	Dec-92
Estonia	Apr-94	Feb-97	Sri Lanka	Sep-91	May-93
Georgia	Mar-94	Aug-97	Trinidad and Tobago	Sep-94	Dec-96
Grenada	May-86	Mar-89	Tunisia	May-90	Feb-93
Honduras	Jul-95	Jul-01	Turkey	Dec-85	May-90
Jamaica	Feb-94	Mar-97	Ukraine	Mar-94	Nov-96
Jordan	Jul-97	Jun-03	Uruguay	Nov-05	Nov-06

Notes: The table lists all bilateral investment treaties between the United States and a partner country signed as of 2024.^a Data from the US Department of State (2024).^b Terminated as of Jun-12.^c Terminated as of May-

Table A5. Complete List of Countries Within Panel

Albania	Bulgaria	Eswatini	Israel	Moldova	Portugal	Tajikistan
Algeria	Cabo Verde	Fiji	Italy	Mongolia	Qatar	Tanzania
Angola	Cambodia	Finland	Jamaica	Morocco	Romania	Thailand
Argentina	Cameroon	France	Japan	Mozambique	Russia	Trinidad and Tobago
Armenia	Canada	Gabon	Jordan	Myanmar	Saudi Arabia	Tunisia
Australia	Central African Republic	Gambia	Kazakhstan	Namibia	Senegal	Turkey
Austria	Chile	Georgia	Kenya	Nepal	Serbia	Turkmenistan
Azerbaijan	China	Germany	Kuwait	Netherlands	Seychelles	Uganda
Bahamas	Colombia	Ghana	Kyrgyzstan	New Zealand	Sierra Leone	Ukraine
Bahrain	Costa Rica	Greece	Laos	Nicaragua	Singapore	United Arab Emirates
Bangladesh	Cote d'Ivoire	Guatemala	Latvia	Nigeria	Slovakia	United Kingdom
Barbados	Croatia	Honduras	Lebanon	Norway	Slovenia	Uruguay
Belarus	Cyprus	Hong Kong	Libya	Oman	South Africa	Uzbekistan
Belgium	Czechia	Hungary	Lithuania	Pakistan	South Korea	Venezuela
Belize	Denmark	Iceland	Luxembourg	Panama	Spain	Vietnam
Bermuda	Dominican Republic	India	Malawi	Papua New Guinea	Sri Lanka	Zambia
Bolivia	Ecuador	Indonesia	Malaysia	Paraguay	Sudan	Zimbabwe
Botswana	Egypt	Iran	Malta	Peru	Sweden	
Brazil	El Salvador	Iraq	Mauritius	Philippines	Switzerland	
Brunei	Estonia	Ireland	Mexico	Poland	Taiwan	

Notes: The 137 countries included in the panel over the 1995–2022 period. Total: 137 countries.

APPENDIX B

This appendix outlines the indexes used in this paper – the Hofstede 6 Cultural Dimensions and the Heritage Economic Freedom Index.

The Hofstede index in its current form is comprised of six "dimensions": Individualism, Power Distance, Motivation Towards Success, Uncertainty Avoidance, Long-term Orientation and Indulgence (The Culture Factor Group, 2024). Collectively, these metrics provide insight into the structural dynamics of a society's culture.

Table B1. Hofstede 6 Cultural Dimensions

Dimension	Definition
Individualism	The extent to which people feel independent, as opposed to being interdependent as members of larger wholes.
Power Distance	The extent to which the less powerful members of organisations and institutions (like the family) accept and expect that power is distributed unequally.
Motivation Towards Success	The extent that society is driven by competition, achievement and success, with success being defined by the winner or best in field.
Uncertainty Avoidance	Quantifies a society’s tolerance for uncertainty and ambiguity.
Long-term Orientation	The extent to which society adapts to the future versus honouring tradition.
Indulgence	The extent to which people try to control their desires and impulses, based on the way they were raised.

The Heritage Economic Freedom Index, as opposed to the Fraser Institute Index, measures economic freedom based on 12 quantitative and qualitative factors, grouped into four broad categories, or pillars: Rule of Law, Government Size, Regulatory Efficiency and Open Markets (The Heritage Foundation, 2024).

Table B2. Heritage Economic Freedom Index Pillars

Pillar	Definition
Rule of Law	Tracks the success of market governance, created with measures for property rights, government integrity, judicial effectiveness.
Government Size	The extent of government involvement within society, measured by government spending, tax burden and fiscal health.
Regulatory Efficiency	Quantifies the legal ease of doing business, measured with business freedom, labour freedom and monetary freedom.
Open Markets	The extent which a nation has trade, investment, and financial freedom within its markets.

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