



**Master Thesis Strategy Economics**

# The influence of Trade Integration on Opportunity and Necessity Entrepreneurship

*The role of Institutional Quality and Economic Development*

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The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics and Erasmus University Rotterdam.

## **Abstract**

This research examines the influence of trade integration – in terms of the number of total trade agreements that a country is a member of in a given year – on country-level opportunity and necessity entrepreneurship. Based on prior literature from theory of international trade, entrepreneurship, institutions, and economic development, I propose that trade integration positively influences opportunity entrepreneurship and negatively influences necessity entrepreneurship. To empirically investigate the relationship between trade integration and opportunity/necessity entrepreneurship, I use a random-effects regression model and a panel of 63 countries in 11 geographical regions across the world, covering a timeframe of 16 years. This research contributes to prior literature by making a distinction between opportunity and necessity entrepreneurship (I), verifying the mediating role of institutional quality on the relationship between trade integration and opportunity/necessity entrepreneurship (II), and highlighting the varying impact of trade integration on opportunity/necessity entrepreneurship between developing and developed countries (III).

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## 1. Introduction

The number of trade agreements between countries has increased significantly during the 1990s and 2000s; from a total of fifty registered trade agreements worldwide in the year 1990 to over a total of two hundred trade agreements worldwide in 2010 (WTO, 2013). Hence, countries have become more integrated, and political and economic distances have shrank. However, the effects of trade integration, which implies generating trade flows through trade agreements, on economic growth and development is a subject to debate (Irwin, 2020; Autor, Dorn, Katz, Patterson, & Van Reenen, 2017). The debate is currently deepening, as evidenced by Brexit, the US-China trade war, disputes within NAFTA/USMCA, and the failures of the TIPP/TPP agreements (The Economist, 2020a; The Economist, 2020b; The Wall Street Journal, 2020; The Economist, 2016).<sup>1</sup> Some researchers find that trade integration has a negative or insignificant effect on countries' economic growth (Rodriguez & Rodrik, 2000; Dollar, 1992). Free trade economists, on the other hand, find that integration results in economies of scale and scope, and consequently leads to economic growth (Faghih & Zali, 2018; DiCaprio, Paulina, & Sokolova, 2017).

According to scholars, the conflicting results are caused by an absence of a uniform definition of trade integration (Wacziarg & Welch, 2008; Kali, Méndez, & Reyes, 2007; Yanikkaya, 2003; Rodriguez & Rodrik, 2000; Vamvakidis, 1998; Levine & Renelt, 1992). The use of various measures makes it difficult to find consistent effects. Trade economics defines trade integration as the establishment of free trade between countries through trade agreements (Pass, Lowes, Davis, & Kronish, 1991). Additionally, trade agreements are wide-ranging treaties, consisting of policies and supranational institutions.<sup>2</sup> As such, trade integration goes beyond trade liberalisation – the reduction of trade barriers (Pass et al., 1991). Defining trade integration solely as average trade barrier or free trade index seems therefore inadequate and narrow (Grossman, 2016; Sachs, Warner, Åslund, & Fisher, 1995). Hence, in this research trade integration is measured by the number of total trade agreements that a country is member of in a given year (Moore, Dau, & Mingo, 2021; Francois & Manchin, 2013; Bütthe & Milner, 2008; Rose, 2004).

Moreover, based on prior literature trade integration indirectly affects economic growth through entrepreneurship. The causal effect between trade integration and economic growth is difficult to

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<sup>1</sup> TPP and TIPP stand for Trans-pacific Partnership and Transatlantic Trade and Investment Partnership respectively. The TPP and TIPP are agreements between member countries of the WTO (Baier et al., 2019; The Economist, 2016).

<sup>2</sup> Supranational institutions are institutions formed by two or more national governments through trade agreements (Pass et al., 1991).

estimate, due to the endogenous character of trade integration (Yanikkaya, 2003; Rodriguez & Rodrik, 2000; Vamvakidis, 1998; Levine & Renelt, 1992). Entrepreneurs have the potential to generate economic growth by discovering and exploiting opportunities (Schumpeter, 1949). Hence, scholars find that entrepreneurship explains the effect between trade integration and economic growth (Levine & Renelt, 1992; Riley & Miller, 2013; Van Stel, Carree, & Thurik, 2005; Harrison, 1996; Schumpeter, 1949). Note, in this research entrepreneurship is defined as the creation of new businesses or ventures, which is used interchangeably with the term self-employment in the literature (GEM, n.d.-b).

However, the effect of trade integration on entrepreneurship is not as evident as it seems (Harrison, 1996; Liñán, Paul, & Fayolle, 2020; Faghih & Zali, 2018; Fariselli, Oughton, Picory, & Sugden, 1999). Some scholars find that trade integration positively affects entrepreneurship since trade integration provides access to international markets and therefore increases the number of business opportunities (e.g., Kirzner, 1973). Others find insignificant or negative results and argue that integration leads to higher competition levels, discouraging individuals to become an entrepreneur (e.g., Grossman, 1983). Hence, the effect of trade integration on entrepreneurship is ambiguous.

The distinction between opportunity and necessity entrepreneurship may shed light on the ambiguous effects in the literature. Opportunity entrepreneurs are those pulled to entrepreneurship by opportunity because they seek independence or want to increase income, while necessity entrepreneurs are pushed into entrepreneurship out of necessity due to unemployment or scarcity of wage jobs (Block, Kohn, Miller, & Ullrich, 2015; Acs & Varga, 2005; Reynolds et al., 2002). Therefore, opportunity and necessity entrepreneurs respond differently to the outputs of trade integration e.g., higher competition levels. Additionally, it is relevant to examine the difference between opportunity and necessity entrepreneurship, since they differ in aspiration, innovation, and exploitation of market niches, resulting in different effects on economic growth (Bosma, Acs, Autio, Coduras, & Levie, 2008; McMullen, Bagby, & Palich, 2008; Reynolds, Bygrave, Autio, Cox, Hay, 2002). Opportunity entrepreneurs foster economic growth, while necessity entrepreneurship has limited impact on economic growth (McMullen et al., 2008). Hence, I examine how trade integration influences opportunity/necessity entrepreneurship:

*What is the influence of trade integration on opportunity and necessity entrepreneurship?*

Building on the theory of international trade (Irwin, 2020), institutions (North, 1990), and economic development (Porter, Sachs, & McArthur, 2001), I aim to address this research question by examining the dichotomy between opportunity and necessity entrepreneurship in relation to trade integration,

the mediating role of institutional quality, and the moderating role of economic development. I examine the influence of trade integration on opportunity and necessity entrepreneurship in separate models as opportunity and necessity entrepreneurship respond differently to the outputs of trade integration (Reynolds et al., 2002). Moreover, I examine the country-specific context in which trade integration and opportunity/necessity entrepreneurship takes place (Moore et al., 2021). In order to do so, first, I include institutional quality as a mediator (Kenny and Baron, 1986). Trade integration imposes supranational institutions, which affect the domestic institutional quality. Therefore, trade integration indirectly affects the level of opportunity/necessity entrepreneurship through countries' institutional quality (Moore et al., 2021; WTO, 2013; Bosma et al., 2008). Second, I add a country's level of economic development as moderator to the model (Moore et al., 2021; Sharma, Durand, & Gur-Arie, 1981). The influence of trade integration on opportunity/necessity entrepreneurship differs between developing and developed countries (Moore et al., 2021; Seiermann, 2018; Bosma et al., 2008; Keefer & Knack, 1997). To test my theory and hypotheses on the relationship between trade integration and opportunity/necessity entrepreneurship, I conduct a random-effects regression (Moore et al., 2021), using a dataset of 63 countries in 11 geographical regions across the world (WTO, n.d.-a).

This research provides several contributions to the existing literature on trade integration and entrepreneurship. First, to the best of my knowledge, the influence of trade integration on opportunity/necessity entrepreneurship has not been previously investigated. This is a notable knowledge gap, especially given the deepening political debate around trade integration (Moore et al., 2021; Irwin, 2020). Second, I verify the theoretical arguments of Moore et al. (2021) related to the mediating role of institutional quality. Third, this research adds to the deepening debate around trade integration and economic growth (Irwin, 2020; Acs, 2006), by highlighting the varying impact that trade integration has on developing and developed countries (Moore et al., 2021). Finally, it is relevant to investigate the interplay between trade integration, opportunity/necessity entrepreneurship and the country-specific context, since this provides insights for governments (in developing countries) who want to achieve economic growth and for individuals as trade integration affects the number of business opportunities.

## 2. Literature Review and Hypotheses

### 2.1 Trade Integration and Entrepreneurship

Most reasoning behind the assumption that trade integration is related to entrepreneurship is based on the *entrepreneurial framework conditions* (Moore et al. 2021; Bosma et al., 2008). *Entrepreneurial framework conditions* are referred to as the factors within the business environment that influence the decision to start a business (Acs, 2006). Trade integration affects the business environment in terms of e.g., access to capital and unemployment levels. Hence, scholarship examines these outputs of trade integration (Liñán et al., 2020; Faghih & Zali, 2018; Fariselli et al., 1999). However, there is much debate around the sign of the effects of trade integration on entrepreneurship; some researchers find a positive effect, while others find a negative effect (Moore et al., 2021; Harrison, 1996). The empirical evidence found by scholars may depend on the examined output of trade integration.

Dating back to Schumpeter (1949), free trade economists suggest that trade integration has a positive effect on entrepreneurship. Integration leads to an increased number of (international) business opportunities as it changes the business environment (Dau, Moore, Soto, & LeBlanc, 2017; Bosma et al., 2008; Acs, Morck, & Yeung, 2001; Kirzner, 1973). This is in line with the process of *entrepreneurial discovery*; the process of scanning for (financial, technological, and political) changes to discover opportunities (Acs et al., 2001). Entrepreneurs in a relatively open market are more encouraged to pursue these opportunities (Faghih & Zali, 2018), since integrated markets result in more access to capital and knowledge (Kali et al., 2007; Acs et al., 2001). First, access to capital is a determinant of venture creation as it influences the ability of individuals to enter the market (Audretsch, 2007-a; Audretsch, Keilback, & Lehmann, 2006). Scholars find that better access to capital increases the likelihood of an individual becoming an entrepreneur (Ho & Wong, 2007; Van Gelderen, Thurik, & Bosma, 2005). Second, open markets lead to increased knowledge spillovers. The knowledge related to foreign markets and technologies may provide insights into unexploited opportunities (Moore et al., 2021; Acs, Desai, & Hessels, 2008; Kali et al., 2007). Acs et al. (2009) find empirical evidence that country-level entrepreneurship is significantly greater in case of knowledge spillovers. Moreover, trade integration changes the business environment in terms of institutional quality (Moore et al., 2021; Baldwin, 2011). Most trade agreements include trade policies regarding trade flows and regulations towards contract enforcement (Baldwin, 2011; Lawrence, 2000).<sup>3</sup> These policies increase institutional

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<sup>3</sup> Lawrence (2000) makes a distinction between shallow and deep trade agreements; shallow agreements mostly cover trade barriers, whereas deep agreements cover a larger set of (trade) policies. Nowadays, most trade agreements are considered deep trade agreements (WTO, n.d.-a).



quality and encourages entrepreneurial activity (Moore et al., 2021; WTO, 2013; Bosma et al., 2008). Scholars find that high institutional quality results in less uncertainty due to e.g., a lower regulatory burden, which lowers the transactional costs of starting a business (Chetthamrongchai, Jermittiparsert, & Saengchai, 2019; Acs et al 2008; Ho & Wong, 2007; Acs, 2006). Additionally, institutional quality can influence the profits an entrepreneur can capture since it affects the relative rates of return from productive activities. For example, better property rights regulations increase the rates of return from innovations (Sobel, 2008). Hence, these outputs of trade integration have a positive effect on entrepreneurship as they decrease the opportunity costs of pursuing self-employment over alternative career choices (McMullen et al., 2008).

Nonetheless, trade integration may have a negative effect as well, since it results in more competition and lower levels of unemployment, increasing the opportunity costs of entrepreneurship (Awad & Youssef, 2016; Badinger, 2007). First, competition resulting from trade agreements may remove the demand for new businesses as a wider range of international goods and services can be imported (Moore et al., 2021). Trade integration also results in higher productivity since firms must be innovative to compete within international markets (Moore et al., 2021; Shu & Steinwender, 2019; Acs et al., 2001). This increases the entry barriers for entrepreneurs (Grossman, 1983). A recent study shows that large innovative firms benefit more from trade integration than small firms (Ramdani, Van Witteloostuijn, Vanderstraeten, Hermans, & Dejardin, 2019). Hence, competition may discourage individuals to become an entrepreneur since the profits that they could capture could be reduced (Shu & Steinwender, 2019). Thereby, increasing the opportunity costs (McMullen et al., 2008). Note, research fields such as political science question the arguments related to competition. They argue that increased levels of competition may encourage individuals as well (Avelino, Brown & Hunter, 2005; Falvey, Foster & Greenaway, 2012). Competition may incentivise entrepreneurs to enter the market to pursue innovative opportunities by combining different resources to create new goods or services (Acs et al., 2001; Kirzner, 1973). In that case, opportunity costs of entrepreneurship are less likely to rise with competition. Another output of trade integration is a lower structural rate of unemployment (Awad & Youssef, 2016; Felbermayr, Prat, & Schmerer, 2011; Dutt, Mitra, & Ranjan, 2009). Scholars find empirical evidence that in the long-run trade integration leads to labour reallocation into more productive firms. The marginal product of labour in a country increases due to the productive firms by encouraging investment which leads to more job creation (Awad & Youssef, 2016). Additionally, lower unemployment levels increase the number of alternative career choices and therefore increase the opportunity costs of becoming an entrepreneur (McMullen et al., 2008).

The type of entrepreneurship may shed light on the debate around the sign of the effects of trade integration on entrepreneurship. Types of entrepreneurs are affected differently by the business environment. For example, scholars show that property rights regulations positively affect opportunity entrepreneurs, while insignificantly affect necessity entrepreneurship (Nikolaev, Boudreaux, & Palich, 2018; Wo & Hong, 2007). Moreover, entrepreneurs motivated by necessity are more likely influenced by the level of unemployment than opportunity entrepreneurs (Nikolaev et al., 2018). Moore et al. (2021) note that there is knowledge gap regarding the research on trade integration and the distinction between types of entrepreneurs. Besides the research of Moore et al. (2021), there is no research investigating different types of entrepreneurs in relation to trade integration and its outputs. Additionally, it is relevant to investigate different types of entrepreneurs since they can have a different effect on economic growth. Hence, in this research the differential impact of trade integration on opportunity/necessity entrepreneurship is investigated, which is discussed in paragraph 2.2.

Moreover, Foss and Klein (2005) note there is another gap of literature investigating the relationship between trade integration itself and entrepreneurship. As aforementioned, trade integration consists of wide-ranging treaties that provide both access to markets, lower market barriers, and supranational institutions. Foss and Klein (2005) therefore argue that research should investigate the direct effect of trade integration on entrepreneurship, instead of solely focusing on the outputs. Some researchers investigate the impact of trade integration itself on entrepreneurship, suggesting that trade agreements result in export opportunities for entrepreneurs (Elo & Freiling, 2015; Wright & Dana, 2003). Elo and Freiling (2015) find that trade agreements generate opportunities to discover and exploit beyond the domestic market. As a result, entrepreneurs become more transnational, operating in both the domestic and foreign market (Chen & Tan, 2009; Brannen, 2004; Saxenian, 2002). In addition, Wright and Dana (2003) suggest that trade agreements transfer a domestic business environment into a supranational environment. The authors argue that those supranational business environments are related to entrepreneurs conducting activities in international niche markets. Moreover, some scholars investigate the impact of the membership of the World Trade Organization (WTO) on entrepreneurial activity in China (Wang, Chen, Zhu, & Anquan, 2005; Wang & Zang, 2005; Zapalska & Edwards, 2001), and in the general and public sector (McClough, 2008). They find that an increase in trade integration as WTO membership results in more innovation by entrepreneurs.

Furthermore, the research on (the outputs of) trade integration on entrepreneurship does not sufficiently examine the context in which trade integration and entrepreneurship take place. This is another notable knowledge gap since prior literature shows the relevance of considering the context. For example, Peberdy (2000) investigates the impact of trade agreements on entrepreneurial activity

in Africa and finds that trade integration hinders entrepreneurship. However, the author does not account for the African country-specific context in terms of development and informal markets. Contrary, Moore et al. (2021) show evidence that there is no significant impact of trade agreements on total entrepreneurship but there is a significant positive impact on entrepreneurs who are formalised. Moreover, the authors show trade integration has a different effect on entrepreneurship across economic development levels. The country-specific contexts relate to the *entrepreneurial ecosystem*, where entrepreneurship is influenced by the factors of the *entrepreneurial framework conditions* (Stam, 2015; Freiling, 2006). To better understand the way trade integration affects entrepreneurship, it is important to study the *entrepreneurial ecosystem*, such as a country's business environment or economic development (Faghih & Zali, 2018).<sup>4</sup> Furthermore, the nature of the relationship between trade integration and entrepreneurship is interdisciplinary (Freiling, 2006; Moore et al., 2021). Therefore, it should be examined by connecting multiple theories e.g., international trade theory, theory of institutions, entrepreneurship theories, and/or knowledge spillover theory (see e.g., Acs, Braunerhjelm, Audretsch, Carlsson, 2009).<sup>5</sup> For instance, the outputs of trade integration, explained by different theories, and the country-specific contexts can be examined as mediating and moderating variables.

Hence, in this research the differential impact of trade integration in terms of trade agreements on opportunity/necessity entrepreneurship is investigated (paragraph 2.2), explained by an output of trade integration, institutional quality (paragraph 2.3), and within the context of developing and developed countries (paragraph 2.4). This will help to bridge the gaps of empirical literature.

## 2.2 Trade Integration, Opportunity, and Necessity Entrepreneurship

As aforementioned, the ambiguous effect of trade integration on entrepreneurship may depend on the type of entrepreneur. Individuals decide to become an entrepreneur because of different (combinations of) motivations (Van der Zwan, Thurik, Verheul, & Hessels, 2016; Reynolds et al., 2002). Generally, a distinction is made between positive motivations that pull and negative motivations that push individuals into entrepreneurship (Van der Zwan et al., 2016; Gilad & Levine, 1986; Shapero & Sokol, 1982). An example of a pull motivation is an opportunity for social development, and push motivations may arise from risks of unemployment. GEM examines the dichotomy between pull and push motivations by introducing opportunity and necessity entrepreneurship (Reynolds et al., 2002). While various measures of opportunity/necessity entrepreneurship exist, it is generally agreed upon

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<sup>4</sup> Economic development (in relation to trade integration and entrepreneurship) is discussed in paragraph 2.4.

<sup>5</sup> The institutional theory (in relation to trade integration and entrepreneurship) is discussed in paragraph 2.3.

that opportunity entrepreneurs are motivated by pull motivations. Opportunity entrepreneurs are pulled entrepreneurship by attractive opportunities and decide to start a business among several career choices (McMullen et al., 2008; Audretsch & Thurik, 2000). Necessity entrepreneurs, on the other hand, are pushed into entrepreneurship due to absence of attractive opportunities and alternative career choices (Thurik, Carree, Van Stel, & Audretsch, 2008; Gilad & Levine, 1986).

The motivation of an entrepreneur to start a business has consequences for the business performance and consequently for the level of economic growth in a country (Block et al., 2015; Hessels, Van Gelderen, & Thurik, 2008). Acs and Varga (2005) find that opportunity entrepreneurs have a significant positive effect on economic growth, whereas necessity entrepreneurship has no significant effect. This can be explained by, for example growth aspirations. Reynolds et al. (2002) find that 14 percent of opportunity entrepreneurs expect to create more than twenty jobs in the future, while only 2 percent of necessity entrepreneurs have similar growth aspirations. Hence, opportunity entrepreneurs seem to have a differential impact on economic growth because they have e.g., higher growth aspirations, are more export-oriented, and create innovative ventures (Angulo-Guerrero, Pérez-Moreno, & Abad-Guerrero, 2017; Acs & Varga, 2015; Block et al., 2015; Hessels et al., 2008; McMullen et al., 2008; Acs, 2006; Wennekers, Van Wennekers, Thurik, & Reynolds, 2005; Schumpeter, 1943). Understanding the levels of opportunity and necessity entrepreneurship, and how these levels are determined, is therefore relevant for policy makers who want to achieve higher levels of economic growth.

The levels of opportunity and necessity entrepreneurship are determined by different country-level factors (Nikolaev et al., 2018).<sup>6</sup> Trade integration could be such a factor since it changes the business environment. As aforementioned, trade integration generates access to international markets. This increases the access to capital, knowledge spillovers, and institutional quality that pull individuals into entrepreneurship (Nikolaev et al., 2018; Sato, Tabuchi, & Yamamoto, 2012; Acs et al., 2008; Wo & Hong, 2007; Van Stel, Storey, & Thurik, 2007). Literature shows that entry barriers such as financial constraints limit individuals who want to become an entrepreneur (Shane & Venkatarman, 2000; Bates 1995). Moreover, the policies of trade agreements concern property rights protection and contract enforcement (Moore et al., 2021; WTO, n.d-c). These policies seem to encourage opportunity entrepreneurship in particular (Angulo-Guerrero et al., 2017; McMullen et al., 2008).<sup>7</sup> For instance, Ho

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<sup>6</sup> Opportunity and necessity entrepreneurship are determined by individual-level factors as well (Giacomin, Janssen, Guyot, & Lohest, 2011; Bhola et al., 2006; Reynolds et al., 2002). These factors are beyond the scope of this research since individual-level determinants are less related to trade integration and trade agreements.

<sup>7</sup> Institutions can affect the level of necessity entrepreneurship as well (see e.g., Fuentelsaz et al., 2015). However, the supranational institutions set by trade agreements contain institutions of property rights

and Wong (2007) find that regulatory business costs hinder opportunity entrepreneurship but have no significant impact on necessity entrepreneurship. Moreover, property rights promote innovative ventures, which is more in line with opportunity entrepreneurship (Fuentelsaz, González, Maícas, & Montero, 2015). These outputs of trade integration therefore positively affect entrepreneurs motivated by opportunity. On the other hand, trade integration lowers unemployment levels and increases competition, which likely influences necessity entrepreneurship (Awad & Youssef, 2016; Dutt et al., 2009). For instance, Deli (2011) finds that unemployment is significantly correlated with necessity entrepreneurship but not with opportunity entrepreneurship. A lower level of unemployment increases the number of alternative career choices for individuals motivated by necessity and existing entrepreneurs may exit the market due to the increased opportunity costs of pursuing self-employment over wage work (McMullen et al., 2008). Additionally, since necessity entrepreneurs are more imitative, the increased competition from innovative firms may reduce the profits captured by necessity entrepreneurs (Shu & Steinwender, 2019; Fuentelsaz et al., 2015). Consequently, the following hypotheses are formulated:

*H1a: Trade integration is positively related to country-level opportunity entrepreneurship.*

*H1b: Trade integration is negatively related to country-level necessity entrepreneurship.*

### *2.2.1 Non-linear impacts of Trade Integration*

Note, Moore et al. (2021) point out the presence of diminishing marginal returns in relation to trade integration (see also Kali et al., 2007). The authors show evidence that the effect of trade integration on entrepreneurship is lower in countries with a higher number of trade agreements. In line with this reasoning, Baier et al. (2019) find evidence that an additional agreement has a weaker effect on trade flows, since policies regarding trade are already implemented. Consequently, it is likely that the outputs of trade integration, such as an increase in competition, in countries with high trade integration already occurred. Hence, an additional agreement may have a weaker impact on opportunity and necessity entrepreneurship:

*H2a: The positive relationship between trade integration and opportunity entrepreneurship decreases as the number of trade agreements increases.*

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protection and economic flexibility. Based on prior research these institutions mostly influence opportunity entrepreneurship, while insignificantly influencing necessity entrepreneurs.

*H2b: The negative relationship between trade integration and necessity entrepreneurship decreases as the number of trade agreements increases.*

### 2.3 The role of Institutional Quality

Trade agreements are wide-ranging treaties, consisting of supranational institutions (Moore et al., 2021; WTO, 2013; Pass et al., 1991). Most trade agreements are under the regulation of the World Trade Organization (WTO) (WTO, 2013). The WTO is a supranational organisation concerned with the rules and standards of trade agreements. It has 164 members and 25 observer governments.<sup>8</sup> Almost every country in the world is member or observer of the WTO, except Eritrea and North Korea (WTO, n.d.-c).<sup>9</sup> The WTO has its own trade agreements that every member country must sign and ratify. Those agreements impose a set of supranational institutions (Ezeani, 2013; Barnett & Finnemore, 2004). The set contains institutions of property rights protection and economic flexibility in terms of contract enforcement, administrative process, and regulation to capital (Moore et al., 2021; WTO, n.d.-b). A country can also establish its own trade agreements with other countries, under the regulation of the WTO, containing additionally institutions (Moore et al., 2021; WTO, n.d.-b; WTO, 2013; Pass et al., 1991). For example, the European Union (EU) is a custom union with a unified external trade policy and tariff (WTO, n.d.-b). Member countries that sign trade agreements need to comply to the supranational institutions.

The supranational institutions lead to the improvement of countries' domestic institutional quality (Bernoth & Wolff, 2008; Clark, 2005; Kraay & Ventura, 2002; WTO, n.d.-b). For example, the Trans-Pacific Partnership (TPP), which is a formally registered trade agreement by the WTO, goes beyond lowering trade barriers and includes policies of property rights and protection of trade secrets.<sup>10</sup> Because of the TPP agreement, member countries have reformed their property rights protection system (Baier et al., 2019). Moreover, member countries can hold each other accountable when they violate the rules of the trade agreements (WTO, n.d.-b; Park, 2015; Singh, 2012; Bernoth & Wolff, 2008; Kali et al., 2007; Bearce & Bondanella, 2007; Clark, 2005; Kraay & Ventura, 2002; Boehmer, Gartzke, &

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<sup>8</sup> Observer status is a privilege granted by the WTO to non-member countries to observe and participate in formal meetings that are of direct interest to them. An observer country is in the progress of becoming a member of the WTO. (WTO, n.d.-c).

<sup>9</sup> Note, there are some small islands groups that are not a member of the WTO, such as the Marshall Islands (WTO, n.d.-c). However, since most countries are member of the WTO, almost all trade agreements worldwide are under the regulation of the WTO.

<sup>10</sup> A trade secret is a type of intellectual property also referred to as confidential information. A trade secret is information that is not generally known to the population of the trading countries, it confers economic benefit for the holder of the intellectual property, and the holder makes reasonable effort to maintain the property a secret (art. 39 of TRIPS (Agreement on Trade-Related Aspects of Intellectual Property Rights)). For more information see: [https://www.wto.org/english/docs\\_e/legal\\_e/27-trips\\_04d\\_e.htm](https://www.wto.org/english/docs_e/legal_e/27-trips_04d_e.htm).

Nordstrom, 2004; Bohman, 1999). For instance, when a member country of the TPP agreement has not made the necessary improvements to its property rights protection system, the country may be fined (Thompson, 2017; Chisik, 2012; Sachs et al., 1995). Therefore, trade agreements pressure member countries to reform their institutions against the risk of disputes. Hence, trade integration increase countries' domestic institutional quality.

In turn, the increased level of domestic institutional quality impacts country-level opportunity/necessity entrepreneurship (Angulo-Guerrero et al., 2017; Aparicio, Urbano, & Audretsch, 2016). North (1990) indicates that *the rules of the game*, institutions, are the factors that determine entrepreneurial activity (Baumol, 1990; Williamson, 1985). He makes a distinction between formal institutions e.g., political, legal, and economic norms, and contracts that decrease transaction costs, and informal institutions. This research focuses solely on formal institutions, since I argue that the supranational institutions (e.g. property rights protection) have a more direct impact on the domestic formal institutions than on informal institutions. For instance, Moore et al. (2021) investigate if the rule of law, a proxy for formal institutions, influences the effect of trade integration on entrepreneurship. They argue that institutions reduce the barriers for new venture creation, lower the transactional costs of starting a business, and therefore provide the exploitation of business opportunities (Chetthamrongchai, Jermittiparsert, & Saengchai; Thompson, 2017; Francois & Manchin, 2013). Hence, there is a greater likelihood of individuals becoming an entrepreneur when institutional quality of institutions is high. Several scholars find a positive relationship between institutions and opportunity entrepreneurship, while necessity entrepreneurs are discouraged by higher institutional quality (Boudreaux, Nikolaev, & Klein, 2019; Angulo-Guerrero, 2017; Bradley & Klein, 2016; Herrera-Echeverri, Haar, & Estévez-Bréton, 2014; Simón-Moya, Revuelto-Taboada, & Guerrero, 2014; McMullen et al., 2008; Nyström, 2008; Estrin, Aidis, & Mickiewicz, 2007). Hence, opportunity entrepreneurship, rather than necessity entrepreneurship, should enjoy the benefits of the increased level of institutional quality.

Hence, trade integration indirectly influences opportunity and necessity entrepreneurship through a country's institutional quality (Kenny and Baron, 1986). The supranational institutions of trade agreements increase countries' institutional quality. The increased level of domestic institutional quality positively influences country-level opportunity entrepreneurship, while negatively influencing necessity entrepreneurship. Hence, institutional quality mediates the influence of trade integration on opportunity/necessity entrepreneurship (Kenny and Baron, 1986):

*H3a: The positive relationship between trade integration and opportunity entrepreneurship is mediated by institutional quality.*

*H3b: The negative relationship between trade integration and necessity entrepreneurship is mediated by institutional quality.*

## 2.4 The role of Economic Development

Prior research shows that country-level entrepreneurship changes through development stages (Wennekers et al., 2005; Acs et al., 2001). Porter et al. (2001) distinguishes three stages of economic development: the factor-, efficiency-, and innovation-driven stage (Acs et al., 2008). Countries in the factor-driven stage are marked by high levels of small-scale subsistence self-employment in informal markets. Those countries neither create knowledge for innovation nor use knowledge for exporting. In the second stage, countries increase production efficiency and educate individuals to adjust to technological development and economies to scale. The level of self-employment decreases as manufacturing activities merge, increasing the number of wage jobs. The last stage, the innovation-driven stage, is marked by an increase in entrepreneurial activity. The share of manufacturing activities decreases in this stage. It becomes easier to substitute capital for labour and therefore easier to start a business (Acs et al., 2008; Audretsch, 2007-b; Acs & Armington, 2006). While most developed countries are in the innovation-driven stage, developing countries are in the efficiency- and factor-driven stage.

The level of trade integration varies across economic development stages as well (Acs et al., 2008). Developed countries are more integrated due to their higher level of innovation – a competitive advantage within international markets (Acs et al., 2008; UNCTAD, 2006). Developing countries, on the other hand, are less integrated due to their characteristics e.g., institutional quality, higher levels of corruption, more income inequality, less educational opportunities, and less resources (Keefer & Knack, 1997). Developing countries are susceptible to the influence of external actors e.g., trading partners, because of their characteristics (Tomz, 2012; Nayyar, 2011; Ocampo, 2011). According to scholars, developing countries rarely set the terms of trade agreements (Moore et al., 2021; Seiermann, 2018; Büthe & Milner, 2008). Therefore, it is likely that those countries reform their institutions to comply to supranational institutions set by their more developed trading partners (Büthe & Milner, 2008). As aforementioned, the TPP agreement imposed a property rights system (Correa, 2000). While most developed countries already have such institutions, developing countries need to reform and improve their systems (Moore et al., 2021; Helpman, 2009). In accordance with



this argument, Moore et al. (2021) examine the moderating effect of three economic development levels on trade integration and types of entrepreneurship. The authors suggest that in lowest-developed countries the effect of trade integration on entrepreneurship is greater than for middle- and highest-developed countries, since developing countries are less integrated and more susceptible to supranational institutions.<sup>11</sup>

In addition, GEM highlights that developing and developed countries have different levels of opportunity and necessity entrepreneurship. In general, developing countries have a higher level of necessity entrepreneurs, due to difficulties in finding wage work (Bosma et al., 2008; Cowling & Bygrave, 2002). Since I propose that trade integration negatively affects necessity entrepreneurs, this can also be explained by the fact that developing countries are less integrated (Acs et al., 2008). For example, levels of necessity entrepreneurs for Brazil and Chile ranged between 6.5 percent and 7.5 percent in 2002, compared to 0.33 percent and 0.43 percent in Denmark and Finland (Desai, 2011; Cowling & Bygrave, 2002). Conversely, an abundance of business opportunities, higher levels of trade integration, and better institutional quality in developed countries, increases the level of opportunity entrepreneurs. Scholars argue that country-level of opportunity/necessity entrepreneurship changes throughout the development process (Liñán et al., 2020; Autio, 2007).

Bearing in mind that developing countries are susceptible to external actors and are less integrated, I argue that the influence of trade integration varies between developing and developed countries. This impacts opportunity and necessity entrepreneurship proportionately according to the varying influence (Sharma et al., 1981). Hence, the level of economic development moderates the influence of trade integration on opportunity/necessity entrepreneurship:

*H4a: The positive relationship between trade integration and opportunity entrepreneurship is moderated by economic development, such that the influence is stronger for developing countries than developed countries.*

*H4b: The negative relationship between trade integration and necessity entrepreneurship is moderated by economic development, such that the influence is stronger for developing countries than developed countries.*

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<sup>11</sup> According to Moore et al. (2021) trade integration may have a trickle-down effect when firms in a developed country with high trade integration and institutional quality internationalise into a country with lower trade integration levels. When firms internationalise, they may bring standards of trade integration to international markets and may encourage supranational institutions through their supply chains.

## 2.5 Trade Integration, Opportunity and Necessity Entrepreneurship within Country-specific Contexts

The previous hypotheses predict the positive (negative) impact of trade agreements on opportunity (necessity) entrepreneurship based on arguments related to the outputs of trade integration (H1). Additionally, trade integration goes beyond the reduction of trade barriers, imposing a set of supranational institutions, which in turn shapes countries' institutional quality. Therefore, I propose that the institutional quality mediates the relationship between trade integration and opportunity/necessity entrepreneurship (H3). Moreover, the economic development level may have a moderating role on the relationship (H4). The influence of trade integration on opportunity/necessity entrepreneurship are likely stronger in developing countries than developed countries. Figure 1 displays the conceptual model of the discussed hypotheses.

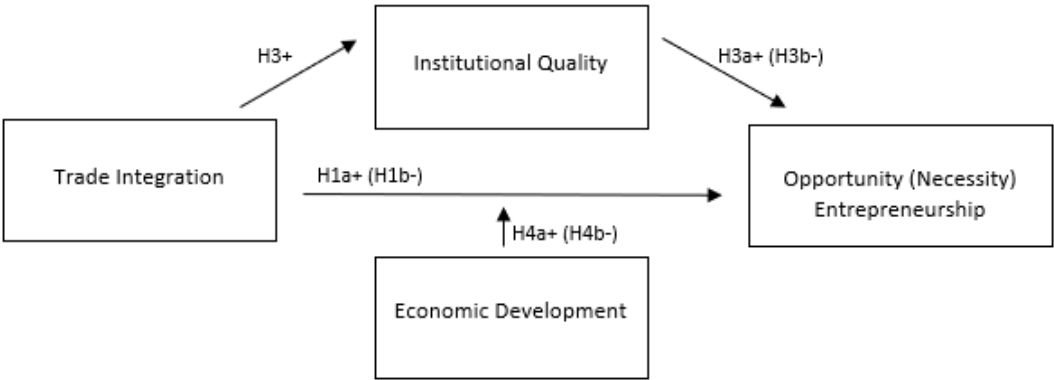


Figure 1. Conceptual Model of Hypotheses.

### 3. Empirical Approach

#### 3.1 Data

##### 3.1.1 *Sample and Data Sources*

To test the influence of trade integration on opportunity and necessity entrepreneurship, a country-level panel dataset is constructed using several data sources: the Global Entrepreneurship Monitor (GEM), WTO Regional Trade Alliance (RTA), Fraser Institute, and World Bank Indicators (WBID) dataset.<sup>12</sup> The main data comes from the RTA, established as part of WTO's Transparency Mechanism, and GEM database. The RTA is an extensive database that contains, among others, information on preferential trade agreements, trade tariffs, and selected provisions from trade agreements of 219 countries over time (1948-2021) (WTO, n.d.-a). This dataset is therefore used to measure trade integration. The GEM dataset is an extensive dataset as well, used by governments to formulate policies about entrepreneurship, and by other stakeholders to examine the *entrepreneurial ecosystem* across countries (GEM, n.d.-b). The GEM database consists of, among others, the Adult Population Survey (APS). The APS examines entrepreneurs' characteristics, ambitions, and motivations to start a business. Furthermore, the GEM contains information on the population's opinion and attitude towards entrepreneurship. The variables in the survey are initially measured at individual level but are aggregated to obtain country-level observations. These variables at country-level are used in this research. Furthermore, the data on countries' institutional quality are from the Fraser Institute, and the moderating variable and control variables are from the WBID. Additionally, to ensure consistent results, I will use country-year observation when data is available for all variables. The discussed decisions regarding the data result in a total of 583 country-year observations, and the sample includes 63 countries and covers a timeframe from 2002 up to and including 2017 (16 years).<sup>13</sup>

##### 3.1.1 *Variables and Measures*

###### *Dependent Variables*

The dependent variables are *Opportunity Entrepreneurship* and *Necessity Entrepreneurship*. Both types of entrepreneurship are measured using the Total Early-Stage Entrepreneurial Activity (TEA) measure (GEM, n.d.-b). TEA is the aggregate number of nascent entrepreneurs or owners of very young firms, where a young firm is classified as a company that has been operating for a maximum of 42 months, as percentage of the population aged 18-64 per country per year. Note, TEA expresses entrepreneurship in terms of career choice (Parker, 2005). So, the reference category of TEA contains

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<sup>12</sup> Table A3 presents an overview of the measurement and data source per variable.

<sup>13</sup> Table A1 provides the list of 63 countries and the number of years represented in the sample.

individuals in a country with a different career choice e.g., wage workers and unemployed individuals. The variables *Opportunity Entrepreneurship* and *Necessity Entrepreneurship* measure the aggregate number of opportunity and necessity entrepreneurs as percentage of TEA entrepreneurs per country per year. The percentage of opportunity and necessity entrepreneurs are based on the APS, asking individuals if they consider opportunity or necessity as a motivate for their entrepreneurial activity (Angulo-Guerrero et al., 2017; Wong, Ho, & Autio, 2005).

#### *Explanatory Variable*

The explanatory variable of interest is *Trade Integration*. Following Moore et al. (2021), trade integration is defined as the aggregate number of trade agreements per country per year. This data has been validated in prior research to measure trade integration (Moore et al., 2021; Francois & Manchin, 2013; Büthe & Milner, 2008; Rose, 2004). As discussed in the introduction, trade integration in terms of trade agreements represents a broad form of establishing free trade, simultaneously imposing supranational institutions, and promoting institutional reform (Moore et al., 2021; Rose, 2004). Moreover, the variable accounts for entering multiple trade agreements per year and for whether a country withdraws from a trade agreement (Moore et al., 2021; Rose, 2004).<sup>14</sup> Therefore, it represents a country's trade integration profile.

#### *Mediating Variable*

As a proxy for *Institutional Quality* of formal institutions I use the Economic Freedom of the World index (EFW) of the Fraser Institute (Seyoum & Ramirez, 2019; Nikolaev et al., 2018; Hall & Lawson, 2014; Gwartney, Holcombe, & Lawson, 2004). Note, various measures of institutional quality exist, but most studies use economic freedom as measurement (Hall & Lawson, 2014). The EFW index is a composite index including five components: the size of government (I), legal system and property rights (II), sound monetary policies (III), international trade (IV), and regulation (V) (Fraser Institute, n.d.). The index indicates to what extent a country uses institutions to appropriate resources. For example, a high tax rate lowers the rewards of labour, reducing the level of economic freedom. The mediating variable reflects a country's score ranging from 0 to 10; a higher score represents a higher level of economic freedom, and therefore higher institutional quality. Studies suggest that the components of the EFW index may include institutions that are potential substitutes. Therefore, I focus

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<sup>14</sup> Even though the RTA database from WTO allows for reductions in the number of trade agreements, most countries covered by the database have no reductions; withdrawing from trade agreements rarely happens. In my dataset, Venezuela is the only country which has a reduction in number of trade agreements. Venezuela has five country-year observations: 2003, 2005, 2007, 2009 and 2011. In the year 2007 the number of trade agreements drops from three agreements to two.

on the overall index and do not examine the components separately (Boudreaux et al., 2019; Bjørnskov & Foss, 2016).

#### *Moderating Variable*

The variable *Economic Development* is based on the gross national income (GNI) per capita in a country calculated by the World Bank Atlas method (The World Bank, n.d.). By using this method, organisations such as the UN and UNCTAD classify countries by their level of economic development. The GNI is used to measure a country's wealth from year to year. In this research I use a dummy variable taking on value 1 if a country is developed, and 0 otherwise. Additionally, the variable accounts for changes in countries' development level over time.<sup>15</sup> Scholars suggest that GNI is a more appropriate proxy for economic development than GDP, since GDP focuses solely on formal economic transactions (Fioramonti, 2017; Lundberg, 1971). GDP is therefore less appropriate when examining countries with more activities in informal markets i.e., developing countries.

#### *Control Variables*

Based on prior literature on the determinants of entrepreneurship and trade integration, several control variables are included (e.g., Moore et al., 2021; Angulo-Guerrero et al., 2017; Autio et al., 2014; Arenius & Minniti 2005). First, *Year* and *Country* dummies are added to the models to account for time trends in entrepreneurial activity, as well as for differential impacts between countries (e.g., the financial crisis of 2008; Moore et al., 2021). Second, the annual percentage growth rate of *GDP* is included, since this influences the labour force in general and specifically necessity entrepreneurship (Moore et al., 2021; Angulo-Guerrero et al., 2017; Autio et al., 2014; Acs et al., 2008; Nyström, 2008). Third, *Foreign Direct Investment* (FDI) net inflows as percentage of GDP is included to account for knowledge and demand spillovers created by investment flows (Faghih & Zali, 2018; Angulo-Guerrero et al., 2017; Kreft & Sobel, 2005). Fourth, I control for *Education* by adding the secondary education rate of a country (Testa & Frascheri, 2015; Keefer & Knack, 1997). The secondary education rate is the total enrolment in secondary education, regardless of age, as percentage of the population of the official age group in secondary education. Although results remain ambiguous at individual-level (Alvarez & Urbano, 2012; Blanchflower, 2004), at country-level a higher secondary (and tertiary) education rate is related to higher country-level entrepreneurship (Van Praag & Van Stel, 2013).<sup>16</sup> Furthermore, the annual percentage growth rate in *Population* is used to examine the exogenous

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<sup>15</sup> Table A2 provides the list of 63 countries based on their economic development level in the first (2002) and last (2017) year of the sample (as indicative of change in economic development level over time).

<sup>16</sup> Gross tertiary school enrollment is not included as control variable, since this variable of the WBID is not widely available for countries in the sample.

growth of labour (Hopenhayn, Neira, & Singhania, 2018; Lévesque & Minniti, 2011; Minniti & Arenius, 2003). Scholars find that population growth has a positive effect on entrepreneurship due to the expansion of new markets (Fuentelsaz et al., 2015; Wennekers, 2005). Moreover, the percentage of the population that is *Female* is added following prior literature on entrepreneurship (Faghih & Zali, 2018; Angulo-Guerrero et al., 2017). Finally, *Unemployment* as percentage of the labour force is included following the International Labour Organization Estimate,<sup>17</sup> since the level of opportunity and necessity entrepreneurship are influenced by country-level unemployment (Berglann, Moen, Røed, & Skogstrøm, 2011; Faria, Cuestas, & Mourelle, 2010; Nyström, 2008).

### *Instrumental Variables*

In this research instrumental variable regressions are used. An instrumental variable is a tool for testing whether there is an endogeneity concern with trade agreements and opportunity/necessity entrepreneurship (Büthe & Milner, 2008). A good instrument is often hard to find, since it must satisfy two assumptions: it must be a (strong) determinant of the independent variable (I),<sup>18</sup> and not be correlated with the error terms and the dependent variable (II). Based on prior literature (Büthe & Milner, 2008; Mansfield, 1998), I use the *Number of Trade Agreements in the Region* where a country is geographically located as an instrument.<sup>19</sup> According to Mansfield (1998) the number of trade agreements signed by countries in the same geographic region is a determinant of a country's trade integration profile. Geographic regions face different challenges and opportunities due to differences in resources and political relationships (Moore et al., 2021). In addition, *Ageing* – percentage of the population aged above 65 and more – is used as instrument. In ageing societies, the share of manufacturing activities and labour reduces. As such, countries with an older population see a reduction in welfare (Nikolaev et al., 2018; WTO, 2013). Nevertheless, trade integration results in a long-lasting improvement in terms of consumption and prices within ageing societies (Mérette & Georges, 2010). It is likely that the number of trade agreements in a geographical region and the percentage of the population aged above 65 do not directly influence individuals to start a business, but rather through levels of trade integration.

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<sup>17</sup> For more information on the International Labour Organization Estimate see: <https://ilostat.ilo.org/>.

<sup>18</sup> F-test from the first stage of the instrumental variable approach shows the significance of the instruments. In both cases, *Ageing* ( $F = 262.71$ ;  $p\text{-value} < 0.01$ ) and *The number of Trade Agreement in the Region* ( $F = 957.87$ ;  $p\text{-value} < 0.01$ ), the F-statistic is greater than 10 – the rule of thumb for weak instruments proposed by Staiger and Stock (1997).

<sup>19</sup> The eleven geographic regions across the world as defined by the WTO are used to divide the countries in different regions (WTO, n.d.-a).

### 3.1.2 Descriptive Statistics

The descriptive statistics –mean, standard deviations (S.D.), minimum, and maximum value – are presented in Table 1. Table A4 (Appendix) presents the pairwise correlations of the same set of variables. Note, *Opportunity Entrepreneurship* and *Necessity Entrepreneurship* are highly correlated since both variables are measured using country-level TEA. Nevertheless, the high correlation is not a concern since opportunity and necessity entrepreneurship are used in separate models. All other pairwise correlation coefficients in Table A4 are relatively low and the Variance Inflation Factors (VIF) test represented in Table A5 shows values below the restrictive level of 5, which diminishes the concerns for multicollinearity (Hsiao, 2014).<sup>20</sup>

**Table 1.** Descriptive Statistics

Variable	Mean	S.D.	Min.	Max.
Opportunity Entrepreneurship	72.67	11.86	10.18	93.00
Necessity Entrepreneurship	22.95	12.18	2.93	80.08
Trade Integration	18.34	12.39	0	41
Institutional Quality	7.37	0.75	3.76	8.93
Economic Development	0.59	0.49	0	1
GDP	2.72	3.22	-10.89	25.16
FDI	5.21	9.03	-15.75	86.59
Education	101.89	17.39	47.51	163.93
Population	0.71	0.70	-2.26	2.89
Female	50.83	0.95	48.41	54.02
Unemployment	8.23	5.31	0.21	33.76
Number of Trade Agreements in the Region	58.97	28.54	6	107
Ageing	13.07	4.90	3.62	22.50

<sup>20</sup> The Pairwise Correlation matrix and VIF-test are presented in Table A4 and A5, respectively. The rule of thumb: correlation  $\leq 0.8$  and VIF  $\leq 10$  (Hsiao, 2014).

## 3.2 Method

### 3.2.1 Research Design

The primary method used in this research is random-effects regression with clustered standard errors by country for panel data to account for serial correlation and heteroskedasticity (Stock & Watson, 2008; Greene, 2003).<sup>21</sup> The Sargan-Hansen test for over-identifying restrictions indicates that a random-effects regression is more appropriate compared to the fixed-effects regression ( $\chi^2 = 12.708$ , p-value > 0.10).<sup>22</sup> Moreover, the Breusch-Pagan Lagrange multiplier test indicates that a random effects regression is appropriate for the dependent variables ( $\chi^2 = 101.08$ , p-value  $\leq 0.01$ ;  $\chi^2 = 178.54$ , p-value  $\leq 0.01$ ). The method is validated for panel data of this structure (country-year observations) and accounts for the nature of the independent and dependent variables (Wooldridge, 2014). Moreover, it is appropriate for moderating and mediating variables (Long & Freese, 2006). Finally, the data are collected at country-level and are organised per country per year. This structure and research design allow to account for divergence across variables and unobserved heterogeneity (Moore et al., 2021; Raudenbush & Bryk, 2002).<sup>23</sup>

The following equations are used to test hypotheses 1a, and 1b:

$$\begin{aligned} & \text{Opportunity Entrepreneurship}_{it} \\ & = \beta_0 + \beta_1 * \text{Trade Integration}_{it} + \beta_2 * \text{Economic Development}_{it} + \beta_m \\ & * \text{Control Variables}_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (1a)$$

$$\begin{aligned} & \text{Necessity Entrepreneurship}_{it} \\ & = \beta_0 + \beta_1 * \text{Trade Integration}_{it} + \beta_2 * \text{Economic Development}_{it} + \beta_m \\ & * \text{Control Variables}_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (1b)$$

where  $\eta_t$  stands for the year dummies,  $\mu_i$  symbolises the country dummies, and  $\varepsilon_{it}$  presents the error term. The subscripts indicate whether the variable changes per country  $i$  and/or over time  $t$ . Equation (1a) and (1b) use trade integration measured by the number of trade agreements. Equations (2a) and (2b) use the logarithmic transformation of trade integration to test hypotheses 2a and 2b and find the

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<sup>21</sup> The alternative models, ordinary least squares (OLS) and two stage least square (2SLS), are used as robustness test, and therefore discussed in paragraph 4.2.

<sup>22</sup> The fixed-effects regression assumes that the variables are uncorrelated with the idiosyncratic error. The random-effects regression uses an additional assumption that the variables are uncorrelated with the group-specific error. This additional assumption can be regarded as an overidentifying restriction. Hence, the Sargan-Hansen test is used to test whether a fixed- or random-effects regression is more appropriate. Moreover, the statistical software package STATA cannot perform a Hausman test when models contain clustered standard errors. Therefore, the Sargan-Hansen is more fitting in this research.

<sup>23</sup> The concerns of endogeneity are discussed in paragraph 3.2.2.



non-linear impacts of trade integration (Wooldridge, 2014). A significant value for  $\beta_1$  in equations (2a) and (2b) confirm both the direct influence of trade integration, as well as the presence of diminishing marginal returns.

$$\begin{aligned} & \text{Opportunity Entrepreneurship}_{it} \\ &= \beta_0 + \beta_1 * \text{Ln(Trade Integration)}_{it} + \beta_2 * \text{Economic Development}_{it} + \beta_m \\ & * \text{Control Variables}_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (2a)$$

$$\begin{aligned} & \text{Necessity Entrepreneurship}_{it} \\ &= \beta_0 + \beta_1 * \text{Ln(Trade Integration)}_{it} + \beta_2 * \text{Economic Development}_{it} + \beta_m \\ & * \text{Control Variables}_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (2b)$$

Hypotheses 3a and 3b predict that the relationship between trade integration and opportunity/necessity entrepreneurship is mediated by institutional quality. To confirm this hypothesis, I obtain the indirect effect of the mediator. The indirect effect is the calculated difference in coefficients of *Trade Integration* ( $\beta_1$ ), as proportion of the effect of trade integration (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Kenny and Baron, 1986; Sobel, 1982).<sup>24</sup> In other words, the coefficients of trade integration ( $\beta_1$ ) from equations (1a) and (1b) are compared to coefficients from equations (3a) and (3b), respectively.<sup>25</sup>

$$\begin{aligned} & \text{Opportunity Entrepreneurship}_{it} \\ &= \beta_0 + \beta_1 * \text{Trade Integration}_{it} + \beta_2 * \text{Institutional Quality}_{it} \\ & + \beta_3 * \text{Economic Development}_{it} + \beta_m * \text{Control Variables}_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (3a)$$

$$\begin{aligned} & \text{Necessity Entrepreneurship}_{it} \\ &= \beta_0 + \beta_1 * \text{Trade Integration}_{it} + \beta_2 * \text{Institutional Quality}_{it} + \beta_3 \\ & * \text{Economic Development}_{it} + \beta_m * \text{Control Variables}_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (3b)$$

To examine the moderating role of economic development on the relationship between integration of trade and opportunity/necessity entrepreneurship, the interaction term of the variables *Economic*

<sup>24</sup> The approach for testing mediators by Baron and Kenny (1986) is used to identify the assumptions for mediation effects, namely: the independent variable is a significant estimator of the dependent variable (I); the independent variable is a significant estimator of the mediator (II); the mediator is a significant estimator of the dependent variable; and the coefficient of the independent variable is reduced, or insignificant, after adding the mediator (IV).

<sup>25</sup> The indirect effect can be calculated by using the khb-method, as proposed by Kohler, Karlson, and Holm (2011) and the approach of Judd and Kenny (1981) – subtracting the regression coefficient obtained in the model including the mediator from the coefficient in the simple model.

*Development* and *Trade Integration* is included (Sharma et al., 1981). Developing countries serve as the reference category, meaning that  $\beta_1$  measures the impact of trade integration on opportunity/necessity entrepreneurs in equations (4a) and (4b) for developing countries. Consequently,  $\beta_3$  records the differential impact of trade integration on opportunity/necessity entrepreneurship between developing (reference category) and developed countries. A positive (negative) significant value for  $\beta_3$  indicates that the influence of trade integration is greater (lower) for developed countries than for developing.

$$\begin{aligned}
 & \text{Opportunity Entrepreneurship}_{it} \\
 & = \beta_0 + \beta_1 * \text{Trade Integration}_{it} + \beta_2 * \text{Economic Development}_{it} + \beta_3 \\
 & \quad * \text{Trade Integration.Economic Development}_{it} + \beta_m * \text{Control Variables}_{it} \\
 & \quad + \eta_t + \mu_i + \varepsilon_{it}
 \end{aligned} \tag{4a}$$

$$\begin{aligned}
 & \text{Necessity Entrepreneurship}_{it} \\
 & = \beta_0 + \beta_1 * \text{Trade Integration}_{it} + \beta_2 * \text{Economic Development}_{it} + \beta_3 \\
 & \quad * \text{Trade Integration.Economic Development}_{it} + \beta_m * \text{Control Variables}_{it} \\
 & \quad + \eta_t + \mu_i + \varepsilon_{it}
 \end{aligned} \tag{4b}$$

### 3.2.2 Concerns of Endogeneity

There are potential concerns of endogeneity, namely omitted variable bias, measurement error, and reverse causality, due to e.g., the endogenous character of trade integration. Therefore, estimating the effect of trade integration on opportunity/necessity entrepreneurship may generate biased results. The estimates are therefore not be interpreted as causal effects but as associations.

An omitted variable bias occurs when an unobserved variable is correlated with both the dependent variable – opportunity/necessity entrepreneurship – and explanatory variable – trade integration (Wooldridge, 2014). A benefit of panel data is that it aids to control for time-invariant heterogeneity. An example of a time-invariant omitted variable bias in this research is a cultural variable e.g., language. Although cultural variables are not included in the models, the country dummies aid to account for country-specific variables that do not change over time and are potentially correlated with trade integration. Furthermore, the time dummies account for time trends. For example, the time dummies control for a trend of a change in entrepreneurial activity e.g., the financial crisis of 2008. (e.g., the financial crisis of 2008). Moreover, including time-variant control variables, such as *Population* and *Unemployment*, will reduce the concerns of endogeneity. However, there may be other time-variant variables that are not included and are potentially correlated with trade integration, resulting in a time-variant omitted variable bias. For example, in line with this research, informal

institutions may potentially have a biasing effect. The literature review discussed briefly that trade integration and entrepreneurship may depend on informal institutions. Informal institutions, however, are not included in the models due to the scope of the research.

Another potential endogeneity concern is measurement error. Measurement error is a systemic error in the accumulation of the data (Wooldridge, 2014). It occurs when there is a difference between the measured value and the true value of the variable. As mentioned beforehand, the dataset is constructed using various data sources, creating missing values in the data. Hence, data are not available for all variables per country and year. Moreover, countries are not represented evenly since they do not participate in the GEM database every year; a couple of countries have observations for all years in the timeframe while others only have three years of observations in total. In order to reduce this measurement error, and obtain consistent and reliable results, I only use country-year observations when data is available for all variables.<sup>26</sup>

Finally, reverse causality indicates that the dependent variable – opportunity/necessity entrepreneurship – also influences the explanatory variable – trade integration (Wooldridge, 2014). Although most literature examines the effect of trade integration on entrepreneurship, entrepreneurship may affect integration of trade as well. The true effect of trade integration on opportunity/necessity entrepreneurship will then be over(under)estimated. For example, scholars show that firms e.g., multinationals and governments, impose and drive trade agreements (Liñán et al., 2020; Paul, 2015; Baldwin, 2011). In line with the theory on political entrepreneurship (Dean & McMullen, 2007) – entrepreneurs who stimulate the creation of and change to government structures – it is likely that, among other firms, entrepreneurs drive trade agreements and trade integration (Moore et al., 2021; Wang, Chen, Zhu, & Anquan, 2005; Wang & Zang, 2005). Note, a strategy used in prior research to reduce concerns of endogeneity is the instrumental variable approach. This approach is discussed and examined in paragraph 4.2.1.

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<sup>26</sup> This includes the control and instrumental variables from WBID and RTA database. Note, additional control variables on population attitudes towards entrepreneurship are used as robustness test. These variables e.g., the perception of good career choice, have multiple missing values in the data, indicating that in a certain country those questions regarding attitudes are left out of the survey in a given year.

## 4. Results

### 4.1 Primary Method

Table 2 includes the results of the random-effects regression on the influence of trade integration on opportunity entrepreneurship, testing Hypotheses 1a, 2a, 3a, and 4a. Table 3 includes the estimates for the analyses of the influence of trade integration on necessity entrepreneurship, providing tests for Hypotheses 1b, 2b, 3b, and 4b.

#### 4.1.1 *The influence of Trade Integration on Opportunity and Necessity Entrepreneurship*

The results indicate that trade integration increases the level of opportunity entrepreneurship in a country ( $\beta = 0.19$ , p-value  $\leq 0.01$ , Table 2 Model 1), while decreasing country-level necessity entrepreneurship ( $\beta = -0.18$ , p-value  $\leq 0.01$ , Table 3 Model 7). Hence, I find support for Hypotheses 1a and 1b. In terms of magnitude, an increase in the number of trade agreements by one agreement increases the level of opportunity entrepreneurship by approximately 0.19 percentage points. The level of necessity entrepreneurship decreases by 0.18 percentage points if a country signs another trade agreement. Models 4 and 10 contain the logarithmic form of trade integration to test for the non-linear impacts. The logarithmic form of trade integration is positive and significant for opportunity entrepreneurship ( $\beta = 2.60$ , p-value  $\leq 0.01$ , Table 2 Model 4) and negative and significant for necessity entrepreneurship ( $\beta = -2.70$ , p-value  $\leq 0.01$ , Table 3 Model 10). These results are consistent with the direct impact of trade integration on opportunity/necessity entrepreneurship and shows the non-linear impacts as predicted by Hypothesis 2a and 2b: the positive (negative) influence of trade integration on opportunity (necessity) entrepreneurship decreases as the aggregated number of trade agreements increases.

#### 4.1.2 *The mediating role of Institutional Quality*

As discussed in the literature review, a mechanism explaining that trade integration influences opportunity and necessity entrepreneurship is institutional quality. Models 5 and 11 include the mediator *Institutional Quality* to test Hypothesis 3a and 3b.<sup>27</sup> The indirect effects are significant and indicate that institutional quality represents 26% and 28% of the influence of trade integration on opportunity and necessity entrepreneurship, respectively ( $\beta = 0.05$ , p-value  $\leq 0.05$  [26%], Table 2

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<sup>27</sup> The approach for testing mediators by Baron and Kenny (1986) is fulfilled; the coefficient of the independent variable *Trade Integration* is reduced (in magnitude) after adding the mediator (assumption IV), indicating partly mediation. Moreover, the mediator *Institutional Quality* is a significant estimator of the dependent variables (assumption III).

Model 5;  $\beta = -0.05$ ,  $p\text{-value} \leq 0.05$ , [28%], Table 3 Model 11). In other words, institutional quality mediates the relationship between trade integration and opportunity/necessity entrepreneurship, supporting Hypotheses 3a and 3b. In line with prior empirical evidence (Bradley and Klein, 2016), the coefficients of *Institutional Quality* confirm that opportunity entrepreneurship is positively affected by formal institutions and necessity entrepreneurship is discouraged by institutions ( $\beta = 3.02$ ,  $p\text{-value} \leq 0.01$ , Table 2 Model 5;  $\beta = -3.34$ ,  $p\text{-value} \leq 0.05$ , Table 3 Model 11). In terms of magnitude, if the EFW index of a country increases by one point, the level of opportunity (necessity) entrepreneurship increases (decreases) by approximately 3 percentage points.

**Table 2:** Random-effects Regression estimates for the influence of Trade Integration on Opportunity Entrepreneurship

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Trade Integration			0.19*** (0.05)		0.14*** (0.05)	0.35*** (0.070)
Ln (Trade Integration)				2.60*** (0.86)		
Institutional Quality					3.02*** (1.06)	
<i>Indirect Effect</i>					0.05** (0.01) [26%]	
Economic Development		5.65*** (1.84)	6.46*** (1.58)	6.52*** (1.70)	5.38*** (1.68)	10.89*** (2.73)
Trade Integration.Economic Development						-0.24** (0.10)
GDP	0.16 (0.17)	0.19 (0.17)	0.22 (0.16)	0.26 (0.17)	0.20 (0.15)	0.22 (0.16)
FDI	0.05 (0.04)	0.03 (0.04)	0.02 (0.05)	0.02 (0.05)	0.01 (0.05)	0.02 (0.05)
Education	0.20*** (0.04)	0.16*** (0.05)	0.10** (0.04)	0.11** (0.04)	0.10** (0.04)	0.09** (0.05)
Population	1.31 (1.14)	1.39 (1.11)	2.31** (1.09)	2.27** (1.11)	2.30** (1.04)	2.63** (1.12)
Female	1.17 (0.99)	0.99 (1.00)	1.08 (0.94)	1.17 (0.96)	0.70 (0.87)	0.65 (0.91)
Unemployment	-0.73*** (0.14)	-0.72*** (0.14)	-0.70*** (0.14)	-0.68*** (0.15)	-0.63*** (0.14)	-0.61*** (0.15)
Constant	-3.02 (51.76)	-7.08 (52.87)	-2.92 (49.46)	-5.36 (50.50)	1.86 (46.17)	22.96 (48.04)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	583	583	583	567	583	583
Countries	63	63	63	63	63	63
R <sup>2</sup>	0.260	0.322	0.352	0.353	0.377	0.345

Note: \*\*\*  $p\text{-value} \leq 0.001$ , \*\*  $p\text{-value} \leq 0.01$ , \*  $p\text{-value} \leq 0.05$ . Regression coefficients displayed with standard errors clustered by country between parentheses. Year and Country dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets.

#### 4.1.3 *The moderating role of Economic Development*

Models 6 and 12 add the interaction term of *Trade Integration* and *Economic Development*. In general, the level of opportunity (necessity) entrepreneurship is significantly higher (lower) in developed countries than in developing countries ( $\beta = 10.89$ , p-value  $\leq 0.01$ , Table 2 Model 6;  $\beta = -10.81$ , p-value  $\leq 0.01$ , Table 3 Model 12). As aforementioned, the coefficient of *Trade Integration* measures the influence on opportunity/necessity entrepreneurship for the reference category – developing countries. Additionally, the interaction term measures the differential influence between developing and developed countries, which is significant and negative in Model 6 and significant and positive in Model 12 ( $\beta = -0.24$ , p-value  $\leq 0.05$ ; Table 2 Model 6;  $\beta = 0.21$ , p-value  $\leq 0.05$ ; Table 3 Model 12). This suggests that the influence of trade integration on opportunity and necessity entrepreneurship is greater in developing countries than in developed countries, finding support for Hypothesis 4a and 4b. In terms of magnitude, an increase in trade integration by one trade agreement increases (decreases) the level of opportunity (necessity) entrepreneurship by approximately 0.3 percentage points in developing countries ( $\beta = 0.35$ , p-value  $\leq 0.01$ ; Table 2 Model 6;  $\beta = -0.32$ , p-value  $\leq 0.01$ ; Table 3 Model 12), while in developed countries opportunity (necessity) entrepreneurship increases (decreases) by only 0.11 percentage points.

#### 4.1.4 *Other Results*

The control variables are mostly unaffected by the inclusion of the explanatory, mediating, and moderating variable, except for *Population*. The impact of population growth on opportunity and necessity entrepreneurship becomes significant after including *Trade Integration* (Table 2 and Table 3). This change indicates that trade integration captures some of the impact of *Population* on opportunity/necessity entrepreneurship. One explanation for this change is that trade integration may influence the population growth of a country, since research shows that trade agreements affect immigration flows (Walmsley & Winters, 2005), which encourages opportunity entrepreneurship (Table 2), and discourages necessity entrepreneurship (Table 3). In line with the literature, the level of unemployment has a positive and significant impact on necessity entrepreneurship (Table 2). As aforementioned, necessity entrepreneurs are pushed into entrepreneurship out of necessity which can be caused by a high level of unemployment (Block, Kohn, Miller, & Ullrich, 2015; Acs & Varga, 2005; Reynolds et al., 2002). Moreover, the secondary education rate in a country is positively associated with opportunity entrepreneurship (Table 2), and negatively with necessity entrepreneurship (Table 3). At country-level a higher secondary education rate is related to higher country-level entrepreneurship. In addition, opportunity entrepreneurs tend to have higher educational levels (Giacomin, Janssen, Guyot, & Lohest, 2011; Bholal, Verheul, & Grilo, 2006).

**Table 3:** Random-effects Regression estimates for the influence of Trade Integration on Necessity Entrepreneurship

Variable	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Trade Integration			-0.18*** (0.05)		-0.13** (0.05)	-0.32*** (0.07)
Ln (Trade Integration)				-2.70*** (0.93)		
Institutional Quality					-3.34*** (1.03)	
<i>Indirect Effect</i>					-0.05** (0.01)	
					[28%]	
Economic Development		-5.73*** (1.65)	-6.74*** (1.43)	-6.51*** (1.52)	-5.76*** (1.42)	-10.81*** (2.59)
Trade Integration.Economic Development						0.21** (0.09)
GDP	-0.17 (0.17)	-0.19 (0.16)	-0.21 (0.16)	-0.24 (0.17)	-0.18 (0.15)	-0.22 (0.16)
FDI	-0.07 (0.04)	-0.06 (0.04)	-0.05 (0.05)	-0.05 (0.05)	-0.04 (0.05)	-0.05 (0.05)
Education	-0.17*** (0.04)	-0.14*** (0.04)	-0.09** (0.04)	-0.09** (0.04)	-0.08** (0.04)	-0.07* (0.04)
Population	-1.72 (1.11)	-1.76 (1.08)	-2.58** (1.04)	-2.51** (1.04)	-2.58*** (0.97)	-2.86*** (1.08)
Female	-1.63 (1.03)	-1.43 (0.99)	-1.52* (0.92)	-1.53 (0.95)	-1.06 (0.84)	-1.11 (0.87)
Unemployment	0.76*** (0.13)	0.76*** (0.14)	0.74*** (0.14)	0.74*** (0.16)	0.67*** (0.13)	0.66*** (0.14)
Constant	119.84** (53.33)	109.43** (51.74)	113.71** (48.12)	117.94** (49.44)	113.29*** (43.76)	94.49** (45.77)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	583	584	585	567	587	588
Countries	63	63	63	63	63	63
R <sup>2</sup>	0.288	0.381	0.415	0.422	0.443	0.406

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors clustered by country between parentheses. Year and Country dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets.

4.2 Robustness Tests

To rule out the possibility that the findings are caused by conflicting explanations, I conduct several robustness tests, which are discussed in the upcoming paragraphs.

4.2.1 Alternative Methods

As a robustness test and to reduce concerns of endogeneity, I carried out two alternative methods, namely a pooled ordinary least squares (OLS) regression and a two stage least squares (2SLS) regression, both with clustered standard errors by country (Moore et al., 2021).<sup>28</sup> Common approaches within the research field of trade and entrepreneurship are instrumental variables, regression discontinuity, difference-in-difference, and Bayesian models (Abadie & Gardeazabal, 2003; Antonakis, Bendahan, Jacquart, & Lalive, 2010; Guo & Fraser, 2014; Li, 2013-a; Li, 2013-b; Morgan & Winship, 2015). None of these approaches is fully satisfactory, meaning reducing all potential endogeneity concerns. However, literature shows that different approaches (OLS and 2SLS) find broadly similar results. A pooled OLS regression examines the variation in the data, both across and within countries. A 2SLS regression is used to allow for consistent results taking into consideration the three discussed endogeneity concerns. The instrumental variable approach reduces those concerns and accounts for the potential endogenous nature of trade integration (Wacziarg & Welch, 2008), by computing estimated values of trade integration (first stage), and then using the computed values to estimate the linear regression model of the dependent variable (second stage). Figure 2 displays how the instrumental variable approach works.

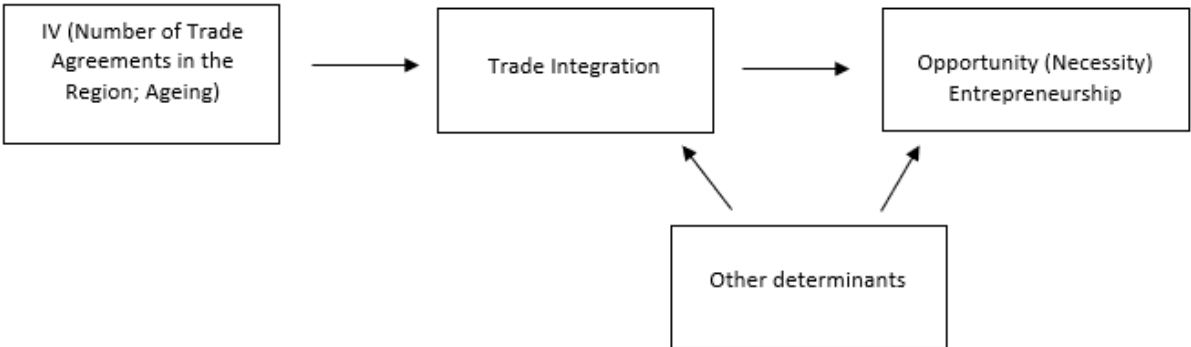


Figure 2. Conceptual Model of Instrumental Variable Approach.

<sup>28</sup> In the 2SLS regressions I take the mediating and moderating variables into consideration, using standard procedure to examine mediation and interaction effects in an instrumental variable approach.



The Pooled OLS regression shows broadly similar results: trade Integration is positively (negatively) related to opportunity (necessity) entrepreneurship ( $\beta = 0.20$ ,  $p$ -value  $\leq 0.01$ , Table 4 Model 13;  $\beta = -0.21$ ,  $p$ -value  $\leq 0.01$ ; Table 4 Model 16), the relationship is mediated by institutional quality ( $\beta = 0.05$ ,  $p$ -value  $\leq 0.01$ , [25%], Table 4 Model 13;  $\beta = -0.06$ ,  $p$ -value  $\leq 0.01$ , [29%], Table 4 Model 16). Moreover, the level of opportunity (necessity) entrepreneurship is higher (lower) in developed countries than in developing countries ( $\beta = 7.12$ ,  $p$ -value  $\leq 0.05$ ; Table 4 Model 15;  $\beta = -7.88$ ,  $p$ -value  $\leq 0.05$ ; Table 3 Model 18). However, it is important to note that the interaction term becomes insignificant in the OLS regression.

**Table 4:** Pooled OLS Regression estimates for the influence of Trade Integration on Opportunity and Necessity Entrepreneurship

Variable	Opportunity Entrepreneurship			Necessity Entrepreneurship		
	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
Trade Integration	0.20*** (0.05)	0.15*** (0.05)	0.23*** (0.08)	-0.21*** (0.06)	-0.15** (0.06)	-0.22** (0.09)
Institutional Quality		3.06*** (0.84)			-3.21*** (0.79)	
<i>Indirect Effect</i>		0.05*** (0.01)			-0.06*** (0.01)	
		[25%]			[29%]	
Economic Development	6.43*** (1.70)	4.53** (1.76)	7.12** (3.17)	-7.60*** (1.72)	-5.61*** (1.66)	-7.88** (3.11)
Trade Integration.Economic Development			-0.04 (0.12)			0.02 (0.12)
GDP	0.19 (0.16)	0.16 (0.16)	0.18 (0.16)	-0.10 (0.17)	-0.07 (0.16)	-0.10 (0.17)
FDI	-0.02 (0.04)	-0.04 (0.04)	-0.02 (0.04)	0.00 (0.05)	0.02 (0.06)	0.00 (0.05)
Education	0.12** (0.05)	0.12*** (0.05)	0.12** (0.05)	-0.14*** (0.04)	-0.14*** (0.04)	-0.14*** (0.04)
Population	2.71** (1.34)	2.63** (1.29)	2.78** (1.38)	-3.21** (1.29)	-3.12** (1.21)	-3.23** (1.30)
Female	0.01 (0.99)	-0.14 (0.96)	-0.06 (1.00)	-0.37 (0.97)	-0.22 (0.93)	-0.34 (1.00)
Unemployment	-0.67*** (0.20)	-0.61*** (0.18)	-0.65*** (0.20)	0.72*** (0.21)	0.66*** (0.19)	0.72*** (0.21)
Constant	55.28 (52.92)	41.95 (50.65)	58.11 (53.64)	60.99 (51.38)	74.96 (48.75)	59.84 (52.65)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	583	583	583	583	583	583
Countries	63	63	63	63	63	63
R <sup>2</sup>	0.363	0.385	0.363	0.434	0.456	0.434

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors between parentheses. Standard errors are clustered by country. Year and Country Dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets.

The results of the instrumental variable approach confirm the robust findings in the primary models: trade Integration is positively (negatively) related to opportunity (necessity) entrepreneurship ( $\beta = 0.21$ ,  $p\text{-value} \leq 0.01$ , Table 5 Model 19;  $\beta = -0.22$ ,  $p\text{-value} \leq 0.01$ , Table 5 Model 22), the relationship is mediated by institutional quality ( $\beta = 0.04$ ,  $p\text{-value} \leq 0.05$ , [19%], Table 5 Model 20;  $\beta = -0.05$ ,  $p\text{-value} \leq 0.05$ , [23%], Table 5 Model 23), and greater in developing countries than in developed countries ( $\beta = -0.24$ ,  $p\text{-value} \leq 0.05$ , Table 5 Model 21;  $\beta = 0.21$ ,  $p\text{-value} \leq 0.05$ ; Table 5 Model 24).

**Table 5:** 2SLS Regression estimates for the influence of Trade Integration on Opportunity and Necessity Entrepreneurship, using The Number of Trade Agreements in the Region and Ageing as instruments.

Variable	Opportunity Entrepreneurship			Necessity Entrepreneurship		
	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
Trade Integration	0.21*** (0.06)	0.17** (0.07)	0.35*** (0.07)	-0.22*** (0.06)	-0.17*** (0.06)	-0.32*** (0.07)
Institutional Quality		2.89*** (1.06)			-3.13*** (1.01)	
<i>Indirect Effect</i>		0.04** (0.01)			-0.05** (0.01)	
		[19%]			[23%]	
Economic Development	6.55*** (1.56)	5.51*** (1.64)	10.93*** (2.73)	-6.95*** (1.41)	-6.00*** (1.39)	-10.80*** (2.59)
Trade Integration.Economic Development			-0.24** (0.10)			0.21** (0.09)
GDP	0.23 (0.16)	0.20 (0.15)	0.22 (0.16)	-0.22 (0.16)	-0.19 (0.15)	-0.22 (0.16)
FDI	0.02 (0.05)	0.01 (0.05)	0.02 (0.05)	-0.04 (0.05)	-0.04 (0.05)	-0.05 (0.05)
Education	0.10** (0.05)	0.09** (0.04)	0.09** (0.05)	-0.08** (0.04)	-0.08** (0.04)	-0.08** (0.04)
Population	2.42** (1.08)	2.41** (1.03)	2.63** (1.11)	-2.76*** (1.03)	-2.74*** (0.96)	-2.86*** (1.08)
Female	1.11 (0.93)	0.71 (0.87)	0.66 (0.90)	-1.53* (0.91)	-1.07 (0.83)	-1.09 (0.87)
Unemployment	-0.69*** (0.14)	-0.63*** (0.14)	-0.61*** (0.15)	0.74*** (0.14)	0.67*** (0.13)	0.67*** (0.14)
Constant	1.48 (49.13)	1.92 (46.03)	22.40 (48.00)	113.97** (47.56)	112.60** (43.53)	93.90** (45.77)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	583	583	583	583	583	583
Countries	63	63	63	63	63	63

Note: \*\*\*  $p\text{-value} \leq 0.01$ , \*\*  $p\text{-value} \leq 0.05$ , \*  $p\text{-value} \leq 0.10$ . Regression coefficients displayed with standard errors between parentheses. Standard errors are clustered by country. Year and Country Dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets.

#### 4.2.2 Temporal Effects

It is important to note that it may take different amounts of time before trade integration influences entrepreneurial activity or for the outputs of trade integration to occur that change the business environment e.g., supranational institutions. Additionally, contemporaneous values are less likely to influence opportunity/necessity entrepreneurship if the trade agreement is signed during the same year. Moreover, the amount of time likely varies per trade agreement (Moore et al., 2021). To account for this time variance, I test the robustness of the results using 1-, 2-, and 3-year lag structures of the explanatory variable (Moore et al., 2021; Hsiao, 2014).

The lagged variable *Trade Integration* shows broadly similar results. Trade Integration is significantly positively associated with opportunity entrepreneurship and negatively influences necessity entrepreneurship (Table A6 Appendix 5). The associations are mediated by institutional quality as can be seen from the significant indirect effects in Table A7 (Appendix 5). In terms of magnitude, an increase in trade integration by one trade agreements increases (decreases) opportunity (necessity) entrepreneurship by approximately 0.14 till 0.21 percentage points (Table A6 Appendix 5). However, the size of the mediation effect differs significantly from the primary method. For instance, the mediation effect in Model A9, including the 3-year lag structure of *Trade Integration*, indicates that institutional quality explains 73% of the relation between trade integration and necessity entrepreneurship ( $\beta = -0.11$ , p-value  $\leq 0.01$ , [73%], Table 5 Model 19), whereas in the primary models institutional quality represents only 28% of the relationship ( $\beta = -0.05$ , p-value  $\leq 0.05$ , Table 3 Model 11). Moreover, the coefficient of *Trade Integration* becomes less significant with the 3-year lag structure, and the interaction term becomes insignificant using the 1-, 2-, and 3-year lag structures. In addition, the control variables *Education* and *Population* become less significant. These changes in magnitude and significance may be caused by the unbalanced dataset. The number of observations and countries decreases with the lag structures, since the lagged value of *Trade Integration* is missing when the previous country-year observation is missing. In other words, when a country did not participate in the APS the previous year(s) the number of country-year observations for the lagged value is lower. Decreasing the number of observations in a sample, creates results that are less reliable and precise due to lower statistical power. Moreover, the amount of time it takes for the outputs of trade integration to occur is a complex phenomenon. Therefore, the results are not fully robust under this robustness test, and it remains an open question that should be further addressed with more complete data.

### 4.2.3 Additional Control Variables

To further test the robustness of the results, and in accordance with prior studies, I examine a set of additional control variables that represent a population's attitude toward entrepreneurship – entrepreneurial attitude indicators from the GEM database. Note, these attitudes are related to the informal institutions (i.e., normative aspects) of countries as defined by North (1990). Entrepreneurial attitude indicators from the GEM database reflect the general feeling of the population towards entrepreneurs and their activity. Prior studies show the relevance of entrepreneurial attitudes and find evidence that the perceptions of the population influence opportunity and necessity entrepreneurship (Angulo-Guerrero et al., 2016; GEM, n.d.-a). For example, the perceived opportunities towards entrepreneurship are likely to motivate individuals to exploit opportunities, which increases the rate of opportunity entrepreneurship in a country.

The models with entrepreneurial attitude indicators confirm the robustness of the results of the primary method (Table A9 Appendix 5): trade integration increases (decreases) the level of opportunity (necessity) entrepreneurship in a country, the impacts of trade integration on types of entrepreneurship are mediated by institutional quality and moderated by the level of economic development. Note, the coefficient of *Trade Integration* becomes insignificant for necessity entrepreneurship after including the mediator, indicating fully mediation (Baron & Kenny, 1986). Moreover, the indirect effect is slightly higher than in the primary model. This change may be caused by reduction in the number of country-year observations, since the attitude indicators in the GEM database have multiple missing values.

Moreover, in line with prior literature the perceived opportunities are significantly positively related to opportunity entrepreneurship and negatively related to necessity entrepreneurship. Surprisingly, *Media Attention* has a positive and significant impact on necessity entrepreneurship and an insignificant impact on opportunity entrepreneurship (Table A9 Appendix 5). Moreover, the percentage of the population that consider entrepreneurship as a desirable career choice (*Career Choice*) is significant and negative for opportunity entrepreneurship, while significant and positive for necessity entrepreneurship (Table A10 Appendix 5). These results indicate that *Media Attention* and *Career Choice* in a country stimulate individuals to start a business out of necessity. One explanation for the impacts of *Media Attention* and *Career Choice* on necessity entrepreneurship is that in (developing) countries with a scarcity of wage jobs, entrepreneurship is promoted as a (good) career choice because of the lack of other alternatives. Finding an explanation for the significantly negative relationship between *Career Choice* and opportunity entrepreneurship is harder. It indicates that in countries where the population considers entrepreneurship as a desirable career choice the level of

opportunity entrepreneurship is lower. A Wald test for attitude indicators shows that the additional control variables are jointly significant ( $\chi^2 = 11.06$ ,  $p\text{-value} \leq 0.01$ ; Model A19 Table A9). Excluding *Perceived Opportunities* from the models results in an insignificant coefficient of *Career Choice* ( $p\text{-value} > 0.10$ ). This indicates that the perceived opportunities capture some of the impact of *Career Choice* on opportunity/necessity entrepreneurship. One explanation for this change is that the perceived opportunities in a country influence a population's attitude of entrepreneurship as a career choice. In other words, in countries where the perceived opportunities are low, entrepreneurship is not considered to be a desirable career choice. Therefore, resulting in a lower level of opportunity entrepreneurship.

#### 4.2.4 Post-hoc Analysis: Total Entrepreneurship (TEA)

Although the research focuses on the dichotomy between opportunity and necessity entrepreneurship, total entrepreneurship (TEA) may provide interesting insights based on prior literature. For instance, Moore et al. (2021) do not find a significant impact of trade integration on total entrepreneurship but do find significant results when distinguishing between types of entrepreneurs. Moreover, some scholars find a positive association between entrepreneurship and trade (Dau et al., 2017; Baldwin, 2011; Coyne & Williamson, 2012; Bosma et al., 2008), whereas others suggest that trade integration is negatively related to total entrepreneurship (Chen, Imbs, & Scott, 2009; Grossman, 1983). Thus, I examine the influence of trade integration on the total country-level entrepreneurship (TEA) (Table A10 Appendix 5).

The results show an insignificant coefficient of *Trade Integration* ( $\beta = -0.01$ ,  $p\text{-value} > 0.10$ , Table A10 Model A25 Appendix 5). Including the mediating role of institutional quality and moderating role of economic development provide insignificant results as well (Table A10 Model A26 and A27 Appendix 5). This confirms the ambiguous results in the literature and indicates the relevance of investigating the differential impacts between types of entrepreneurs e.g., opportunity/necessity entrepreneurship. The control variables indicate that the level of education in a country has a positive impact on total entrepreneurship as evidenced in the research field of entrepreneurship (Van Praag & Van Stel, 2013; Table A10 Appendix 5). Moreover, *Economic Development* has a significantly negative influence on total entrepreneurship (Table A10 Appendix 5). This indicates that developed countries have a lower level of total entrepreneurship compared to developing countries. As discussed in the literature review, developing countries are characterised by higher levels of unemployment, more income inequality, less educational opportunities, and less resources. The number of small-scale subsistence

entrepreneurial activity is therefore higher in those countries (Porter et al., 2001; Keefer & Knack, 1997).

#### 4.2.5 *Post-hoc Analysis: Opportunity-to-Necessity Ratio*

As an additional robustness test, I employ a post-hoc analysis using the logarithm of opportunity-to-necessity-ratio to add further nuance to the dichotomy between opportunity and necessity entrepreneurship (Moore et al., 2021; Acs, 2006). Acs (2006) argues that all countries have both levels opportunity and necessity entrepreneurship. He suggests that the ratio of opportunity-to-necessity is useful in examining the dichotomy between opportunity and necessity entrepreneurship. The ratio indicates the importance of (preferred) opportunity entrepreneurship relative to necessity entrepreneurship. Moreover, Acs (2006) explains that this ratio has the advantage that countries with high levels of necessity are classified the same as countries with low levels of entrepreneurship.

The results of this analysis are consistent with the theoretical arguments. The coefficient of *Trade Integration* is positive and significant ( $\beta = 0.01$ , p-value  $\leq 0.01$ , Table A10 Model A28), indicating that the number of trade agreements is positively related to the opportunity-to-necessity ratio. Moreover, since the coefficient of *Trade Integration* becomes insignificant after the inclusion of the mediator (Table A10 Model A29), I conclude that institutional quality fully mediates the relationship between trade integration and the opportunity-to-necessity ratio ( $\beta = 0.01$ , p-value  $\leq 0.01$ , [100%], Table A10 Model A28; Baron & Kenny, 1986). Furthermore, including the interaction term between *Trade Integration* and *Economic Development* results in a positive and significant influence of trade integration on the opportunity-to-necessity ratio in developing countries ( $\beta = 0.05$ , p-value  $\leq 0.01$ , Table A10 Model A30 Appendix 5). The interaction term also indicates that trade integration significantly increases the proportion of opportunity entrepreneurship and that this influence is greater in developing countries than in developed countries ( $\beta = -0.06$ , p-value  $\leq 0.05$ , Table A10 Model A30 Appendix 5).

## 5. Conclusion

The debate around the economic advantages and disadvantages of trade integration – in terms of trade agreements – is currently deepening. Scholars question whether all actors in the international market, including entrepreneurs, benefit from trade agreements. This research provides an understanding of the relationship between trade integration and country-level entrepreneurship by analysing the differential impact of trade agreements on opportunity/necessity entrepreneurs, within the country-specific context of institutional quality and economic development:

*What is the influence of trade integration on opportunity and necessity entrepreneurship?*

The results show that trade integration positively influences opportunity entrepreneurship, while negatively influencing necessity entrepreneurship. As aforementioned in the literature review, trade integration results in a higher number of attractive business opportunities due to an increase in capital and knowledge spillovers (Kali et al., 2007; Acs et al., 2001), pulling individuals into entrepreneurship (Acs et al., 2008). Moreover, trade agreements include trade policies that increase the institutional quality (Moore et al., 2021), which lowers the transactional costs of starting a business (Bosma et al., 2008). On the other hand, trade integration decreases the level of unemployment (Awad & Yousof, 2016), providing a higher number of alternative career choices and therefore lowering country-level necessity entrepreneurship (McMullen et al., 2008). Necessity entrepreneurs may exit the market as well, since increased competition levels from trade integration increase the opportunity costs of becoming an entrepreneur (Shu & Steinwender, 2019).

Moreover, the results show that the influence of trade integration on opportunity and necessity entrepreneurship is mediated by domestic institutional quality and moderated by the level of economic development (Moore et al., 2021). First, trade integration imposes a set of supranational institutions that member countries need to comply to, and therefore positively affect domestic institutional quality. Based on prior literature and the findings of this research (Nikolaev et al., 2018; Acs et al., 2008), higher institutional quality is positively associated with opportunity entrepreneurship, while negatively associated with necessity entrepreneurship. Hence, institutional quality mediates the positive (negative) relationship between trade integration and opportunity (necessity) entrepreneurship. Second, the models including the moderator economic development show that the influence of trade integration on opportunity/necessity entrepreneurship is stronger in developing countries than developed countries (Moore et al., 2021). Developing countries are less integrated and more susceptible to influences of their trading partners (Acs et al., 2008; Nayyar 2011). Additionally,

the results show that the level of opportunity entrepreneurship is higher in developed countries than developing countries.

Furthermore, in line with prior literature on the determinants of entrepreneurship, the results show that the level of unemployment has a positive impact on necessity entrepreneurship. Necessity entrepreneurs are likely pushed into entrepreneurship by a high level of unemployment (Block et al., 2015; Reynolds et al., 2002). The results also show that the secondary education rate has a positive impact on opportunity entrepreneurship. Opportunity entrepreneurs tend to have higher educational levels than necessity entrepreneurs (Giacomin et al., 2011; Bhola et al., 2006). Interestingly, trade integration captures some of the impact of the annual percentage growth rate on opportunity/necessity entrepreneurship. Based on prior research, trade agreements influence the population growth due to immigration flows (Walmsley & Winters, 2005). Higher levels of population and immigration are positively associated with opportunity entrepreneurship as it provides opportunities through knowledge spillovers and competition (Li, Isidor, Dau, & Kabst, 2018; Wennekers, 2005).

This research contributes to prior literature by investigating the dichotomy between opportunity and necessity entrepreneurship, verifying the mediating role of institutional quality, and highlighting the moderating role of economic development. Thereby, the research confirms the relevance of the distinction between types of entrepreneurs, as shown by the results of the primary method as well as the results of the post-hoc analyses containing TEA and opportunity-to-necessity-ratio as dependent variables. Moreover, the research indicates the importance of defining trade integration broadly, as evidenced by the mediating role of institutional quality; the measure of trade integration should contain elements of institutions.

The results and theoretical arguments in this research are important for governments and individuals as well. Since opportunity (necessity) entrepreneurs foster (hinder) economic growth, governments can achieve economic growth by signing into trade agreements, which increases (decreases) country-level of opportunity (necessity) entrepreneurship. The results also suggest that increased trade integration in developing countries has a significant impact on opportunity (necessity) entrepreneurs. This is especially relevant for governments of developing countries that generally have a lower level of economic growth than developed countries. Moreover, the results are relevant for individuals because trade integration results in more career choices. First, trade integration increases the number of attractive business opportunities. Therefore, individuals can become an entrepreneur out of



opportunity. Second, trade integration lowers levels of unemployment. Individuals are therefore less pushed into entrepreneurship and can pursue alternative career choices e.g., wage work.

### 5.1 Limitations and Recommendations

Despite the contributions and implications of this research, the findings should not be interpreted as definitive. In fact, the measurement and data of GEM used to make the dichotomy between opportunity and necessity entrepreneurship has its limitations. First, it implies that an individual is either an opportunity or necessity entrepreneur. Some scholars question whether entrepreneurs can be allocated exclusively to one type of entrepreneurship (Angulo-Guerrero et al., 2017; Giacomini et al., 2011; Williams, 2009; Block and Sandner, 2006). Second, the dependent variables are based on a self-reported question. It may be preferable to use a more objective measurement. For instance, Fairlie and Fossen (2018) use the initial unemployment status. The authors argue that necessity entrepreneurs are individuals who are registered as unemployed before starting a business. Moreover, the data from GEM results in an unbalanced dataset, since not all countries participate every year in the survey (Angulo-Guerrero et al., 2017). Additionally, data on developing countries, especially Sub-Saharan African countries, are less available than data on developed countries. Therefore, not all countries are evenly represented in the sample. Finally, the robustness test analysing the temporal effects of trade integration does not fully support the findings in the primary method. The unbalanced dataset of GEM results in less country-year observations for the lagged values. Therefore, the time it takes before trade integration to influence entrepreneurial activity remains an open question. It is important to further investigate the short-term and long-term effects of trade integration on entrepreneurship since the outputs of trade integration are unlikely to occur directly after signing the trade agreement. Nevertheless, the decision to use the measurement and data from GEM is validated in prior research on country-level opportunity/necessity entrepreneurship (Angulo-Guerrero et al., 2017; Liñán, Romero Luna, & Fernández Serrano, 2013; Cullen, Johnson, & Parboteeah, 2014).

Scholarship would also benefit from investigating the effects of different types of trade integration and other types of entrepreneurs. The effect of trade integration on (opportunity/necessity) entrepreneurship may depend on the type of trade agreement e.g., an agreement that covers goods and/or services, and a bilateral versus plurilateral agreement (WTO, n.d.-a). For instance, trade agreements that cover services result in higher levels of trade integration since services provide knowledge spillovers (Moore et al., 2021; Seiermann, 2018). Another distinction could be made between regional trade areas and global trade agreements. For example, being a member of the EU may have a different effect on entrepreneurship than being member of NAFTA (WTO, n.d.-b). In

addition, the effect of trade integration likely differs between other types of entrepreneurship e.g., female, and innovative entrepreneurship.<sup>29</sup> The results from the first post hoc analysis show that there is no significant effect of trade integration on total entrepreneurship, but trade integration significantly affects types of entrepreneurship.

Furthermore, this research focuses solely on formal institutions in relation to trade integration and opportunity/necessity entrepreneurship. However, prior literature shows that informal institutions, cultural-cognitive aspects, also contribute to the level of trade integration (Baier et al., 2018; WTO, 2013; Felbermayr & Toubal, 2010). For example, scholars find evidence that a common language is a determinant of trade agreements. It would be interesting to investigate the interplay between informal institutions, trade integration, and entrepreneurship. Informal institutions may also explain the differences between levels of opportunity and necessity entrepreneurship between countries (Cullen et al., 2013; Liñán et al., 2013).

Additionally, the results show the relevance of considering the country-specific context in which trade integration and (opportunity/necessity) entrepreneurship take place. Future research could add further nuance by investigating the context of institutional quality and economic development more deeply. For instance, this research examines the overall EFW index, while prior research on the different determinants of opportunity and necessity entrepreneurship suggests that certain components of the EFW index have a stronger impact on either opportunity or necessity entrepreneurship (Angulo-Guerrero et al., 2017). In line with this reasoning, specific characteristics of developing countries may play a more important role in relation to trade integration and (opportunity/necessity) entrepreneurship. For example, developing countries are characterised by more political conflicts and receive international aid, which affects country-level entrepreneurship (Moore, Dau, & Doh, 2020). It would be interesting to investigate which institutions and characteristics of countries are stronger related to trade integration, and if these relationships could also explain the differentiating findings between opportunity and necessity entrepreneurship.

Finally, future research should examine the influence of trade disintegration on (opportunity/necessity) entrepreneurship. The measurement of trade integration accounts for whether a country withdraws from a trade agreement. However, most countries covered by the dataset have no reductions. Nevertheless, withdrawing from a trade agreement can have implications

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<sup>29</sup> In line with the definition of GEM, innovate entrepreneurs are entrepreneurs who consider their product or services as new (GEM, n.d.-b). Innovative entrepreneurship indicates the number of innovate entrepreneurs as percentage of TEA entrepreneurs per country per year.

for a country, including lowering the level of opportunity entrepreneurship. Note, the existing literature examines trade integration rather than trade disintegration, so the data and results in this research are in line with prior research. Future research, on the other hand, may find appropriate data to investigate the effects of withdrawing from trade agreements. It is important to examine the effect of trade disintegration on (opportunity/necessity) entrepreneurship as the number of withdraws from trade agreements is currently increasing, as evidenced by Brexit, the US-China trade war, and the US leaving NAFTA/USMCA.

## References

- Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American economic review*, 93(1), 113-132.
- Acs, Z. (2006). How is entrepreneurship good for economic growth? *Innovations: technology, governance, globalization*, 1(1), 97-107.
- Acs, Z. J., & Armington, C. (2006). *Entrepreneurship, geography, and American economic growth*. Cambridge University Press
- Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small business economics*, 32(1), 15-30.
- Acs, Z. J., Desai, S., & Hessels, J. (2008). Entrepreneurship, economic development and institutions. *Small business economics*, 31(3), 219-234.
- Acs, Z. J., Morck, R. K., & Yeung, B. (2001). Entrepreneurship, globalization, and public policy. *Journal of International management*, 7(3), 235-251.
- Acs, Z. J., & Varga, A. (2005). Entrepreneurship, agglomeration and technological change. *Small business economics*, 24(3), 323-334.
- Alvarez, C., & Urbano, D. (2012). Cultural-cognitive dimension and entrepreneurial activity: A cross-country study. *Revista de estudios sociales*, (44), 146-157.
- Angulo-Guerrero, M. J., Pérez-Moreno, S., & Abad-Guerrero, I. M. (2017). How economic freedom affects opportunity and necessity entrepreneurship in the OECD countries. *Journal of Business Research*, 73, 30-37.
- Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The leadership quarterly*, 21(6), 1086-1120.
- Aparicio, S., Urbano, D., & Audretsch, D. (2016). Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological forecasting and social change*, 102, 45-61.
- Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small business economics*, 24(3), 233-247.
- Audretsch, D.B. (2007-a). Entrepreneurship Capital and Economic Growth. *Oxford Review of Economic Policy* 23(1), 63-78.
- Audretsch, D. B. (2007-b). *The entrepreneurial society*. Oxford University Press on Demand.
- Audretsch, D.B., Keilback, M.C., & Lehmann, E.E. (2006). *Entrepreneurship and Economic Growth*. New York: Oxford University Press.
- Audretsch, D. B., & Thurik, A. R. (2000). Capitalism and democracy in the 21st century: from the managed to the entrepreneurial economy. *Journal of evolutionary economics*, 10(1), 17-34.

- Autor, D., Dorn, D., Katz, L. F., Patterson, C., & Van Reenen, J. (2020). The fall of the labor share and the rise of superstar firms. *The Quarterly Journal of Economics*, 135(2), 645-709.
- Avelino, G., Brown, D. S., & Hunter, W. (2005). The effects of capital mobility, trade openness, and democracy on social spending in Latin America, 1980–1999. *American Journal of Political Science*, 49(3), 625-641.
- Awad, A., & Youssof, I. (2016). The impact of economic globalisation on unemployment: The Malaysian experience. *The Journal of International Trade & Economic Development*, 25(7), 938-958.
- Badinger, H. (2007). Market size, trade, competition and productivity: Evidence from OECD manufacturing industries. *Applied Economics*, 39(17), 2143-2157.
- Baier, S. L., Bergstrand, J. H., & Clance, M. W. (2018). Heterogeneous effects of economic integration agreements. *Journal of Development Economics*, 135, 587-608.
- Baier, S. L., Yotov, Y. V., & Zylkin, T. (2019). On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration. *Journal of International Economics*, 116, 206-226.
- Baldwin, R. (2011). *21st Century Regionalism: Filling the gap between 21st century trade and 20th century trade rules* (No. ERSD-2011-08). WTO Staff Working Paper.
- Barnett, M., & Finnemore, M. (2004). *Rules for the world: International organizations in world politics*. Ithaca, New York: Cornell University Press.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive and destructive. *Journal of Political Economy*, 98(5), 893–921.
- Bearce, D. H., & Bondanella, S. (2007). Intergovernmental organizations, socialization, and member-state interest convergence. *International Organization*, 703-733.
- Berglann, H., Moen, E. R., Røed, K., & Skogstrøm, J. F. (2011). Entrepreneurship: Origins and returns. *Labour economics*, 18(2), 180-193.
- Bernoth, K., & Wolff, G. B. (2008). Fool the markets? Creative accounting, fiscal transparency and sovereign risk premia. *Scottish Journal of Political Economy*, 55(4), 465-487.
- Bhola, R., Verheul, I., Thurik, R., & Grilo, I. (2006). Explaining engagement levels of opportunity and necessity entrepreneurs, EIM Business and Policy Research, H200610.
- Bjørnskov, C., & Foss, N. J. (2016). Institutions, entrepreneurship, and economic growth: what do we know and what do we still need to know? *Academy of Management Perspectives*, 30(3), 292-315.
- Blanchflower, D. G. (2004). *Self-employment: More may not be better* (No. w10286). National Bureau of Economic Research.
- Block, J. H., Kohn, K., Miller, D., & Ullrich, K. (2015). Necessity entrepreneurship and competitive strategy. *Small Business Economics*, 44(1), 37-54.

- Block, J., & Sandner, P. (2006). The effect of motivation on self-employment duration in Germany: Necessity versus opportunity entrepreneurs. Munich Personal RePEc Archive, Paper, 215.
- Boehmer, C., Gartzke, E., & Nordstrom, T. (2004). Do intergovernmental organizations promote peace? *World Politics*, 1-38.
- Bohman, J. (1999). International regimes and democratic governance: political equality and influence in global institutions. *International Affairs*, 75(3), 499-513.
- Bosma, N., Acs, Z. J., Autio, E., Coduras, A., & Levie, J. (2008). Global entrepreneurship monitor. *Executive report*, 125.
- Boudreaux, C. J., Nikolaev, B. N., & Klein, P. (2019). Socio-cognitive traits and entrepreneurship: The moderating role of economic institutions. *Journal of Business Venturing*, 34(1), 178-196.
- Bradley, S. W., & Klein, P. (2016). Institutions, economic freedom, and entrepreneurship: The contribution of management scholarship. *Academy of Management Perspectives*, 30(3), 211-221.
- Brannen, M. Y. (2004). When Mickey loses face: Recontextualization, semantic fit, and the semiotics of foreignness. *Academy of Management Review*, 29(4), 593-616.
- Büthe, T., & Milner, H. V. (2008). The politics of foreign direct investment into developing countries: increasing FDI through international trade agreements? *American journal of political science*, 52(4), 741-762.
- Chen, N., Imbs, J., & Scott, A. (2009). The dynamics of trade and competition. *Journal of International Economics*, 77(1), 50-62.
- Chen, W., & Tan, J. (2009). Understanding transnational entrepreneurship through a network lens: Theoretical and methodological considerations. *Entrepreneurship theory and Practice*, 33(5), 1079-1091.
- Chetthamrongchai, P., Jermittiparsert, K., & Saengchai, S. (2020). How the nexus among the free trade, institutional quality and economic growth affect the trade from ASEAN countries. *Entrepreneurship and Sustainability Issues*, 7(3), 2079.
- Chisik, R. (2012). Trade disputes, quality choice, and economic integration. *Journal of International Economics*, 88(1), 47-61.
- Clark, I. (2005). *Legitimacy in international society*. Oxford University Press on Demand.
- Correa, C. M. (2000). *Intellectual property rights, the WTO and developing countries: the TRIPS agreement and policy options*. Zed books.
- Cowling, M., & Bygrave, W. D. (2002). Entrepreneurship and unemployment: relationships between unemployment and entrepreneurship in 37 nations participating in the Global Entrepreneurship Monitor (GEM) 2002. In *Babson College, Babson Kauffman Entrepreneurship Research Conference (BKERC)* (Vol. 2006).
- Coyne, C. J., & Williamson, C. R. (2012). Trade openness and cultural creative destruction. *Journal of Entrepreneurship and Public Policy*.

- Cullen, J. B., Johnson, J. L., & Parboteeah, K. P. (2014). National rates of opportunity entrepreneurship activity: Insights from institutional anomie theory. *Entrepreneurship Theory and Practice*, 38(4), 775-806.
- Dau, L. A., Moore, E. M., Soto, M. A., & LeBlanc, C. R. (2017). How globalization sparked entrepreneurship in the developing world: The impact of formal economic and political linkages. In *Entrepreneurship: Concepts, Methodologies, Tools, and Applications* (pp. 1881-1900). IGI Global.
- Dean, T. J., & McMullen, J. S. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of business venturing*, 22(1), 50-76.
- Deli, F. (2011). Opportunity and necessity entrepreneurship: Local unemployment and the small firm effect. *Journal of Management Policy and Practice*, 12(4), 38-57.
- Desai, S. (2011). Measuring entrepreneurship in developing countries. In *Entrepreneurship and economic development* (pp. 94-107). Palgrave Macmillan, London.
- DiCaprio, A., Paulino, A. U. S., & Sokolova, M. V. (2017). *Regional trade agreements, integration and development* (No. 1). United Nations Conference on Trade and Development.
- Dollar, D. (1992). Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985. *Economic development and cultural change*, 40(3), 523-544.
- Dutt, P., Mitra, D., & Ranjan, P. (2009). International trade and unemployment: Theory and cross-national evidence. *Journal of International Economics*, 78(1), 32-44.
- The Economist. (2016). *The collapse of the Trans-Pacific Partnership*. Retrieved from: <https://www.economist.com/the-economist-explains/2016/11/23/the-collapse-of-the-trans-pacific-partnership>
- The Economist. (2020a). *A hill of beans to die on. Chronicling Donald Trump's trade war with China*. Retrieved from: <https://www.economist.com/books-and-arts/2020/06/25/chronicling-donald-trumps-trade-war-with-china>.
- The Economist. (2020b). *The end is where we start from. The post-Brexit trade agreement leaves many questions unanswered*. Retrieved from: <https://www.economist.com/britain/2020/12/27/the-post-brexit-trade-agreement-leaves-many-questions-unanswered>.
- Elo, M., & Freiling, J. (2015). Transnational entrepreneurship: An introduction to the volume. *American Journal of Entrepreneurship*, 8(2), IX.
- Estrin, S., Aidis, R., & Mickiewicz, T. (2007). Institutions and entrepreneurship development in Russia: A comparative perspective. *William Davidson Institute working paper*, n. 867.
- Ezeani, E. (2013). WTO post Doha: trade deadlocks and protectionism. *Journal of International Trade Law and Policy*, 12(3), 272-288.
- Faghih, N., & Zali, M. R. (2018). Entrepreneurship Ecosystem in the Middle East and North Africa (MENA). *Dynamics in Trends, Policy and Business Environment*, 707.

Fairlie, R. W., & Fossen, F. M. (2018). Opportunity versus necessity entrepreneurship: Two components of business creation.

Falvey, R., Foster, N., & Greenaway, D. (2012). Trade liberalization, economic crises, and growth. *World Development*, 40(11), 2177-2193.

Faria, J. R., Cuestas, J. C., & Mourelle, E. (2010). Entrepreneurship and unemployment: a nonlinear bidirectional causality? *Economic Modelling*, 27(5), 1282-1291.

Fariselli, P., Oughton, C., Picory, C., & Sugden, R. (1999). Electronic commerce and the future for SMEs in a global market-place: Networking and public policies. *Small Business Economics*, 12(3), 261-275.

Felbermayr, G., Prat, J., & Schmerer, H. J. (2011). Trade and unemployment: What do the data say? *European Economic Review*, 55(6), 741-758.

Felbermayr, G. J., & Toubal, F. (2010). Cultural proximity and trade. *European Economic Review*, 54(2), 279-293.

Fioramonti, L. (2017). *Gross domestic problem: How the politics of GDP shaped society and the world* (pp. 91-109). Routledge.

Foss, N. J., & Klein, P. G. (2005). Entrepreneurship and the economic theory of the firm: any gains from trade? In *Handbook of entrepreneurship research* (pp. 55-80). Springer, Boston, MA.

Fraser Institute. (n.d.). *Economic Freedom*. Retrieved from: 3 <https://www.fraserinstitute.org/economic-freedom/datase>

Francois, J., & Manchin, M. (2013). Institutions, infrastructure, and trade. *World development*, 46, 165-175.

Freiling, J. (2006). *Entrepreneurship*. Munich: Vahlen.

Fuentelsaz, L., González, C., Maícas, J. P., & Montero, J. (2015). How different formal institutions affect opportunity and necessity entrepreneurship. *BRQ Business Research Quarterly*, 18(4), 246-258.

Van Gelderen, M., Thurik, R., & Bosma, N. (2005). Success and risk factors in the pre-startup phase. *Small business economics*, 24(4), 365-380.

Giacomin, O., Janssen, F., Guyot, J. L., & Lohest, O. (2011). Opportunity and/or necessity entrepreneurship? The impact of the socio-economic characteristics of entrepreneurs.

Gilad, B., & Levine, P. (1986). A behavioral model of entrepreneurial supply. *Journal of small business management*, 24, 45.

Global Entrepreneurship Monitor (GEM). (n.d.-a). Retrieved from: <https://www.gemconsortium.org/about/gem/5>

Global Entrepreneurship Monitor (GEM). (n.d.-b). Retrieved from: <https://www.gemconsortium.org/wiki/1154>

Greene, W. H. (2003). *Econometric analysis*. Pearson Education India.



- Grossman, G. M. (1983). *International trade, foreign investment, and the formation of the entrepreneurial class* (No. w1174). National Bureau of Economic Research.
- Grossman, G. M. (2016). The purpose of trade agreements. In *Handbook of commercial policy* (Vol. 1, pp. 379-434). North-Holland.
- Guo, S., & Fraser, M. W. (2014). *Propensity score analysis: Statistical methods and applications* (Vol. 11). SAGE publications.
- Gwartney, J. D., Holcombe, R. G., & Lawson, R. A. (2004). Economic freedom, institutional quality, and cross-country differences in income and growth. *Cato J.*, 24, 205.
- Hall, J. C., & Lawson, R. A. (2014). Economic freedom of the world: An accounting of the literature. *Contemporary Economic Policy*, 32(1), 1-19.
- Harrison, A. (1996). Openness and growth: A time-series, cross-country analysis for developing countries. *Journal of development Economics*, 48(2), 419-447.
- Helpman, E. (Ed.). (2009). *Institutions and economic performance*. Harvard university press.
- Herrera-Echeverri, H., Haar, J., & Estévez-Bretón, J. B. (2014). Foreign direct investment, institutional quality, economic freedom and entrepreneurship in emerging markets. *Journal of Business Research*, 67(9), 1921-1932.
- Hessels, J., Van Gelderen, M., & Thurik, R. (2008). Entrepreneurial aspirations, motivations, and their drivers. *Small business economics*, 31(3), 323-339.
- Ho, Y. P., & Wong, P. K. (2007). Financing, regulatory costs and entrepreneurial propensity. *Small Business Economics*, 28(2), 187-204.
- Hopenhayn, H., Neira, J., & Singhania, R. (2018). *From population growth to firm demographics: Implications for concentration, entrepreneurship and the labor share* (No. w25382). National Bureau of Economic Research.
- Hsiao, C. (2014). *Analysis of panel data* (No. 54). Cambridge university press.
- Irwin, D. A. (2020). *Free trade under fire*. Princeton University Press.
- Judd, C.M. & Kenny, D.A. (1981). Process Analysis: Estimating mediation in treatment evaluations. *Evaluation Review*, 5(5), 602-619.
- Kali, R., Méndez, F., & Reyes, J. (2007). Trade structure and economic growth. *The Journal of International Trade & Economic Development*, 16(2), 245-269.
- Keefer, P., & Knack, S. (1997). Why don't poor countries catch up? A cross-national test of an institutional explanation. *Economic inquiry*, 35(3), 590-602.
- Kirzner, I. M. (1973). *Competition and entrepreneurship*. University of Chicago press.
- Kohler, U., Karlson, K. B., & Holm, A. (2011). Comparing coefficients of nested nonlinear probability models. *The Stata Journal*, 11(3), 420-438.

- Kraay, A., & Ventura, J. (2002). Trade integration and risk sharing. *European Economic Review*, 46(6), 1023-1048.
- Kreft, S. F., & Sobel, R. S. (2005). Public policy, entrepreneurship, and economic freedom. *Cato J.*, 25, 595.
- Lawrence, R. Z. (2000). *Regionalism, multilateralism, and deeper integration*. Brookings Institution Press.
- Lévesque, M., & Minniti, M. (2011). Age matters: How demographics influence aggregate entrepreneurship. *Strategic Entrepreneurship Journal*, 5(3), 269-284.
- Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *The American economic review*, 942-963.
- Li, M. (2013-a). Social network and social capital in leadership and management research: A review of causal methods. *The leadership quarterly*, 24(5), 638-665.
- Li, M. (2013-b). Using the propensity score method to estimate causal effects: A review and practical guide. *Organizational Research Methods*, 16(2), 188-226.
- Li, C., Isidor, R., Dau, L. A., & Kabst, R. (2018). The more the merrier? Immigrant share and entrepreneurial activities. *Entrepreneurship Theory and Practice*, 42(5), 698-733.
- Liñán, F., Romero Luna, I., & Fernández Serrano, J. (2013). Necessity and opportunity entrepreneurship: The mediating effect of culture. *Revista de Economía Mundial*, 33, 21-47.
- Liñán, F., Paul, J., & Fayolle, A. (2020). SMEs and entrepreneurship in the era of globalization: advances and theoretical approaches. *Small Business Economics*, 55(3), 695-703.
- Long, J. S., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata* (Vol. 7). Stata press.
- Lundberg, E. (1971). Simon Kuznets' contribution to economics. *The Swedish Journal of Economics*, 73(4), 444-461.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological methods*, 7(1), 83.
- Mansfield, E. D. (1998). The proliferation of preferential trading arrangements. *Journal of Conflict resolution*, 42(5), 523-543.
- McClough, D. (2008). Public sector entrepreneurship: Evidence from trade policy. *Politics & Policy*, 36(2), 250-267.
- McMullen, J. S., Bagby, D. R., & Palich, L. E. (2008). Economic freedom and the motivation to engage in entrepreneurial action. *Entrepreneurship Theory and Practice*, 32(5), 875-895.
- Mérette, M., & Georges, P. (2010). Demographic changes and the gains from globalisation: An analysis of ageing, capital flows, and international trade. *Global Economy Journal*, 10(3), 1850201.

- Minniti, M., & Arenius, P. (2003, April). Women in entrepreneurship. In *The entrepreneurial advantage of nations: First annual global entrepreneurship symposium* (Vol. 29). United Nations.
- Moore, E. M., Dau, L. A., & Doh, J. (2020). Does monetary aid catalyse new business creation? Analysing the impact of global aid flows on formal and informal entrepreneurship. *Journal of Management Studies*, 57(3), 438-469.
- Moore, E. M., Dau, L. A., & Mingo, S. (2021). The effects of trade integration on formal and informal entrepreneurship: The moderating role of economic development. *Journal of International Business Studies*, 1-27.
- Morgan, S. L., & Winship, C. (2015). *Counterfactuals and causal inference*. Cambridge University Press.
- Nayyar, D. (2011). The financial crisis, the great recession and the developing world. *Global Policy*, 2(1), 20-32.
- Nikolaev, B. N., Boudreaux, C. J., & Palich, L. (2018). Cross-country determinants of early-stage necessity and opportunity-motivated entrepreneurship: accounting for model uncertainty. *Journal of Small Business Management*, 56, 243-280.
- North, D. (1990). *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.
- Nyström, K. (2008). The institutions of economic freedom and entrepreneurship: evidence from panel data. *Public choice*, 136(3), 269-282.
- Ocampo, J. A. (2011). Global economic prospects and the developing world. *Global Policy*, 2(1), 10-19.
- Park, C. U. (2015). Institutional embeddedness of market integration: The formation of free trade agreements in 1957–2008. *International Sociology*, 30(1), 39-60.
- Parker, S. C. (2005). *The Economics of Entrepreneurship: What we know and what we don't*. Now Publishers Inc.
- Pass, C., Lowes, B., Davis, L., & Kronish, S. J. (1991). *The Harper Collins dictionary of economics*.
- Paul, J. (2015). Does the WTO increase trade and cause convergence? *The International Trade Journal*, 29(4), 291-308.
- Peberdy, S. (2000). Mobile entrepreneurship: Informal sector cross-border trade and street trade in South Africa. *Development Southern Africa*, 17(2), 201-219.
- Porter, M., Sachs, J., & McArthur, J. (2001). Executive summary: Competitiveness and stages of economic development.
- Van Praag, M., & Van Stel, A. (2013). The more business owners, the merrier? The role of tertiary education. *Small Business Economics*, 41(2), 335-357.
- Ramdani, D., Van Witteloostuijn, A., Vanderstraeten, J., Hermans, J., & Dejardin, M. (2019). The perceived benefits of the European Union standardization. An exploration according to firm size and firm capabilities. *International Economics and Economic Policy*, 16(2), 379-396.

- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). sage.
- Reynolds, P., Bygrave, W. D., Autio, E., Cox, L. W., Hay, M. (2002). *Global Entrepreneurship Monitor 2002 Executive Report*. Babson College, Wellesley, MA
- Riley, R., & Miller, A. T. (2013). No boost in trade freedom. *Index of economic freedom*.
- Rodriguez, F., & Rodrik, D. (2000). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER macroeconomics annual*, 15, 261-325.
- Rose, A. K. (2004). Do we really know that the WTO increases trade? *American economic review*, 94(1), 98-114.
- Sachs, J. D., Warner, A., Åslund, A., & Fischer, S. (1995). Economic reform and the process of global integration. *Brookings papers on economic activity*, 1995(1), 1-118.
- Sato, Y., Tabuchi, T., & Yamamoto, K. (2012). Market size and entrepreneurship. *Journal of Economic Geography*, 12(6), 1139-1166.
- Saxenian, A. (2002). Transnational communities and the evolution of global production networks: the cases of Taiwan, China and India. *Industry and innovation*, 9(3), 183-202.
- Schumpeter, J.A. (1943). *Socialism, capitalism and democracy*. New York, NY: Harper and Brothers.
- Schumpeter, J. A. (1949) & Harvard University. Research Center in Entrepreneurial History. *Change and the entrepreneur: Postulates and patterns for entrepreneurial history*. Harvard University Press.
- Seiermann, J. (2018). *Only Words? How Power in Trade Agreement Texts Affects International Trade Flows* (No. 80). United Nations Conference on Trade and Development.
- Seyoum, B., & Ramirez, J. (2019). Economic freedom and trade flows. *Journal of Economic Studies*, 46(4), 985-1006.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, 25(1), 217-226.
- Sharma, S., Durand, R. M., & Gur-Arie, O. (1981). Identification and analysis of moderator variables. *Journal of marketing research*, 18(3), 291-300.
- Shapero, A. & Sokol, L. (1982). The social dimensions of entrepreneurship. In Kent, C., Sexton, D. & Vesper, K. (eds). *The Encyclopedia of Entrepreneurship*, Englewood Cliffs, NJ: 72-90.
- Shu, P., & Steinwender, C. (2019). The impact of trade liberalization on firm productivity and innovation. *Innovation Policy and the Economy*, 19(1), 39-68.
- Simón-Moya, V., Revuelto-Taboada, L., & Guerrero, R. F. (2014). Institutional and economic drivers of entrepreneurship: An international perspective. *Journal of Business Research*, 67(5), 715-721.
- Singh, K. (2012). Does globalization spell the end of the nation-state? *Introduction to global politics: A reader*, 327-333.

- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology 1982* (pp. 290-312). Washington DC: American Sociological Association.
- Sobel, R. S. (2008). Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, 23(6), 641-655.
- Staiger, D., & Stock, J. H. (1997). Instrumental variables regression with weak instruments. *Econometrica: journal of the Econometric Society*, 557-586.
- Stam, E. (2015). Entrepreneurial ecosystems and regional policy: a sympathetic critique. *European Planning Studies*, 23(9), 1759-1769.
- Van Stel, A., Carree, M., & Thurik, R. (2005). The effect of entrepreneurial activity on national economic growth. *Small business economics*, 24(3), 311-321.
- Van Stel, A., Storey, D. J., & Thurik, A. R. (2007). The effect of business regulations on nascent and young business entrepreneurship. *Small business economics*, 28(2), 171-186.
- Stock, J. H., & Watson, M. W. (2008). Heteroskedasticity-robust standard errors for fixed effects panel data regression. *Econometrica*, 76(1), 155-174.
- Testa, S., & Frasccheri, S. (2015). Learning by failing: What we can learn from un-successful entrepreneurship education. *The International Journal of Management Education*, 13(1), 11-22.
- Thurik, A. R., Carree, M. A., Van Stel, A., & Audretsch, D. B. (2008). Does self-employment reduce unemployment? *Journal of Business Venturing*, 23(6), 673-686.
- Thompson, G. F. (2017). Are There Any Limits to 'Globalisation'? International Trade, Capital Flows and Borders 1. In *The Caribbean Economies in an Era of Free Trade* (pp. 23-46). Routledge.
- Tomz, M. (2012). *Reputation and international cooperation: sovereign debt across three centuries*. Princeton University Press.
- United Nations Conference on Trade and Development (UNCTAD). (2006). World investment report. *FDI from Developing and Transition Economies: Implications for Development*.
- United Nations Conference on Trade and Development (UNCTAD). (2010). *International Trade. After the Economic Crisis: Challenges and New Opportunities*. Retrieved from: [https://unctad.org/system/files/official-document/ditctab20102\\_en.pdf](https://unctad.org/system/files/official-document/ditctab20102_en.pdf).
- Vamvakidis, A. (1998). Regional integration and economic growth. *The World Bank Economic Review*, 12(2), 251-270.
- Wacziarg, R., & Welch, K. H. (2008). Trade liberalization and growth: New evidence. *The World Bank Economic Review*, 22(2), 187-231.
- The Wall Street Journal. (2020). *USMCA: The Deal's Been Signed, but the Debate Continues*. Retrieved from: <https://www.wsj.com/articles/usmca-the-good-the-bad-and-the-unknown-11580319768>.
- Walmsley, T. L., & Winters, L. A. (2005). Relaxing the restrictions on the temporary movement of natural persons: a simulation analysis. *Journal of Economic Integration*, 688-726.

- Wang, Z., Chen, J., Zhu, Z., & Anquan, W. (2005). A system model for corporate entrepreneurship. *International Journal of Manpower*.
- Wang, Z., & Zang, Z. (2005). Strategic human resources, innovation and entrepreneurship fit: A cross-regional comparative model. *International journal of manpower* 26(6), 544-559.
- Wennekers, S., Van Wennekers, A., Thurik, R., & Reynolds, P. (2005). Nascent entrepreneurship and the level of economic development. *Small business economics*, 24(3), 293-309.
- Williamson, O. E. (1985). *The economic institutions of capitalism: firms, markets, and relational contracting*. New York: Free Press.
- Williams, C.W. (2009). The motives of off-the-book entrepreneurs: necessity-or opportunity driven? *International Entrepreneurship and Management Journal*, 5(2), 203-217.
- Wong, P. K., Ho, Y. P., & Autio, E. (2005). Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small business economics*, 24(3), 335-350.
- Wooldridge, J. M. (2014). *Introductory econometrics: A modern approach*. Mason, OH: Cengage Learning.
- The World Bank. (n.d.). *What is the World Bank Atlas Method?* Retrieved from: <https://datahelpdesk.worldbank.org/knowledgebase/articles/77933-what-is-the-world-bank-atlas-method>.
- World Trade Organization (WTO). (2013). *WTO report: World trends in trade*. Retrieved from: [https://www.wto.org/english/res\\_e/booksp\\_e/wtr13-2b\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/wtr13-2b_e.pdf).
- World Trade Organization (WTO). (n.d.-a). *Regional Trade Agreements. Database*. Retrieved from: <https://rtais.wto.org/UI/About.aspx>
- World Trade Organization (WTO). (n.d.-b). *Understanding the WTO: Membership, alliances and bureaucracy*. Retrieved from: [https://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/org3\\_e.htm](https://www.wto.org/english/thewto_e/whatis_e/tif_e/org3_e.htm).
- World Trade Organization (WTO). (n.d.-c). *Members and Observers*. Retrieved from: [https://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/org6\\_e.htm](https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm).
- Wright, R. W., & Dana, L. P. (2003). Changing paradigms of international entrepreneurship strategy. *Journal of International Entrepreneurship*, 1(1), 135-152.
- Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. *Journal of Development economics*, 72(1), 57-89.
- Zapalska, A. M., & Edwards, W. (2001). Chinese entrepreneurship in a cultural and economic perspective. *Journal of small business management*, 39(3), 286-292.
- Van der Zwan, P., Thurik, R., Verheul, I., & Hessels, J. (2016). Factors influencing the entrepreneurial engagement of opportunity and necessity entrepreneurs. *Eurasian Business Review*, 6(3), 273-295.

## Appendices

### Appendix 1 Countries

**Table A1.** List of countries and the number of years represented in the sample

Countries	Years in the sample	Countries	Years in the sample
Argentina	14	Italy	15
Australia	3	Jamaica	8
Austria	5	Lithuania	4
Barbados	3	Luxembourg	5
Belgium	14	Malaysia	10
Brazil	8	Mexico	11
Bulgaria	3	Netherlands	14
Canada	7	New Zealand	4
Chile	15	North Macedonia	5
China	7	Norway	14
Colombia	11	Panama	7
Costa Rica	3	Peru	13
Croatia	15	Philippines	3
Czech Republic	3	Poland	9
Denmark	12	Portugal	9
Dominican Republic	3	Romania	9
Ecuador	9	Russia	10
Egypt	3	Slovakia	7
El Salvador	3	Slovenia	16
Estonia	6	South Africa	14
Finland	15	South Korea	10
France	15	Spain	16
Germany	15	Sweden	14
Greece	9	Switzerland	12
Guatemala	4	Thailand	10
Hong Kong	6	Tunisia	3
Hungary	14	Turkey	8
Iceland	9	United Kingdom	15
Indonesia	6	United States	16
Iran	10	Uruguay	12
Ireland	14	Venezuela	5
Israel	11		

Note: The total number of country-year observations is 583.

## Appendix 2 Developed and Developing Countries

**Table A2.** List of countries by economic development in 2002 and 2017

2002		2017	
Developed	Developing	Developed	Developing
Australia	Argentina	Australia	Argentina
Austria	Barbados	Austria	Brazil
Belgium	Brazil	Barbados	Bulgaria
Bulgaria	China	Belgium	China
Canada	Colombia	Canada	Chile
Chile	Costa Rica	Czech Republic	Colombia
Croatia	Dominican Republic	Denmark	Costa Rica
Czech Republic	Ecuador	Finland	Croatia
Denmark	Egypt	France	Dominican Republic
Estonia	El Salvador	Germany	Ecuador
Finland	Guatemala	Greece	Egypt
France	Indonesia	Hong Kong	El Salvador
Germany	Iran	Hungary	Estonia
Greece	Jamaica	Iceland	Guatemala
Hong Kong	Lithuania	Ireland	Indonesia
Hungary	Malaysia	Israel	Iran
Iceland	Mexico	Italy	Jamaica
Ireland	North Macedonia	Lithuania	Malaysia
Israel	Panama	Luxembourg	Mexico
Italy	Peru	Netherlands	North Macedonia
Luxembourg	Philippines	New Zealand	Panama
Netherlands	Romania	Norway	Peru
New Zealand	Slovakia	Portugal	Philippines
Norway	South Africa	Romania	Poland
Poland	Thailand	Russia	Slovakia
Portugal	Tunisia	South Korea	Slovenia
Russia	Turkey	Spain	South Africa
Slovenia	Uruguay	Sweden	Thailand
South Korea	Venezuela	Switzerland	Tunisia
Spain		Turkey	Venezuela
Sweden		United Kingdom	
Switzerland		United States	
United Kingdom		Uruguay	
United States			

Note: The table shows the classification of countries in the first and last year of the dataset. Not all country-year observations represented in this table are present in the sample, due to the unbalanced dataset of GEM. However, the table is an indicative of change in economic development over time.



## Appendix 3 Variables, Measures, and Data sources

**Table A3.** Variables, measurement, and data source

Variable	Data Source	Measurement
<i>Opportunity Entrepreneurship</i>	Global Entrepreneurship Monitor	Percentage of those involved in TEA reporting opportunity as a major motive; entrepreneurs claim to be driven by opportunity as opposed to finding no other option for work or indicate the main driver for being involved in this opportunity is being independent or increasing income, rather than just maintaining income.
<i>Necessity Entrepreneurship</i>	Global Entrepreneurship Monitor	Percentage of those involved in TEA reporting necessity as major motive; entrepreneurs who are involved in entrepreneurship because they had no other option for work.
<i>Trade Integration</i>	WTO Regional Trade Alliance Dataset	Total number of trade agreements a country is a member of in a year.
<i>Institutional Quality</i>	Fraser Institute	Composite measure of the degree to which the policies and institutions of countries are supportive of economic freedom, including <i>size of government, legal system and property rights, sound money, and regulations</i> .
<i>Economic Development</i>	World Bank Development Indicators	Gross National Income (GNI) per capita (Atlas Method), using annual categories developed and developing.
<i>GDP</i>	World Bank Development Indicators	Annual percentage growth rate of GDP.
<i>Education</i>	World Bank Development Indicators	Gross enrolment ratio; total enrolment, regardless of age, in secondary education as percentage of the population of the official age group in secondary education.
<i>Unemployment</i>	World Bank Development Indicators	Percentage of the labour force that is unemployed, but available for work and seeking employment; modelled by ILO estimate.
<i>Foreign Direct Investment</i>	World Bank Development Indicators	Foreign direct investment; net inflows as percentage of GDP.
<i>Population</i>	World Bank Development Indicators	Annual percentage growth rate of a country's population.
<i>Female</i>	World Bank Development Indicators	Percentage of the population that is female.
<i>Ageing (IV)</i>	World Bank Development Indicators	Percentage of the population that is aged 65 and above.
<i>Number of Trade Agreements in the Region (IV)</i>	WTO Regional Trade Alliance Dataset	Total number of trade agreements in a region in a year.

Variable	Dataset	Measurement
<i>Total Entrepreneurship (TEA)</i>	Global Entrepreneurship Monitor	Percentage of population aged from 18-64 who are either a nascent entrepreneur (starting a business/venture or just started one with no more than three months experience) or owner-manager of a new business (owning and managing a running business that has paid salaries, wages, or other payments to the owners for more than three months, but not more than 42 months).
<i>Opportunity-Necessity Entrepreneurship Rate</i>	Global Entrepreneurship Monitor	Percentage of those involved in TEA that are opportunity-motivated divided by the percentage of those involved in TEA that are necessity-motivated.
<i>Career Choice</i>	Global Entrepreneurship Monitor	Percentage of population aged 18-64 who agree with the statement that in their country most people consider entrepreneurship as a desirable career choice.
<i>Fear of Failure Rate</i>	Global Entrepreneurship Monitor	Percentage of population aged 18-64 who indicate that the fear of failure would prevent them from being an entrepreneur.
<i>Media Attention</i>	Global Entrepreneurship Monitor	Percentage of population aged 18-64 who agree with the statement that in their country, there are often stories in public media about successful entrepreneurs.
<i>Perceived Opportunities</i>	Global Entrepreneurship Monitor	Percentage of 18-64 who see positive opportunities to start a business in the country where they live.

Note: The measurements of the variables are at country-level. The last variables are alternative dependent variables and additional variables used as robustness checks.

## Appendix 4 Pairwise Correlation and VIF

**Table A4.** Pairwise Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Opportunity Entrepreneurship	1.00										
2. Necessity Entrepreneurship	-0.92*	1.00									
3. Trade Integration	0.33*	-0.35*	1.00								
4. Institutional Quality	0.44*	-0.48*	0.46*	1.00							
5. Economic Development	0.42*	-0.48*	0.34*	0.53*	1.00						
6. GDP	0.02	-0.05	-0.20*	-0.09*	-0.25*	1.00					
7. FDI	0.14*	-0.16*	0.15*	0.22*	0.17*	0.17*	1.00				
8. Education	0.38*	-0.42*	0.45*	0.35*	0.52*	-0.22*	0.18*	1.00			
9. Population	0.07	-0.07	-0.37*	-0.15*	-0.16*	0.18*	0.03	-0.16*	1.00		
10. Female	0.06	-0.04	0.19*	0.12*	0.09*	-0.13*	0.02	0.10*	-0.58*	1.00	
11. Unemployment	-0.36*	0.38*	-0.03	-0.19*	-0.08*	-0.17*	-0.10*	0.01	-0.17*	0.14*	1.00

Note: \*p-value  $\leq 0.05$

**Table A5.** VIF Multicollinearity Test

Variable	VIF	1/VIF
Trade Integration	1.64	0.61
Institutional Quality	1.69	0.59
Economic Development	1.76	0.57
GDP	1.20	0.84
FDI	1.14	0.88
Education	1.59	0.63
Population	1.72	0.58
Female	1.54	0.65
Unemployment	1.15	0.88

## Appendix 5 Additional Results

**Table A6:** Random-effects Regression estimates for the influence of Trade Integration in 1-, 2-, and 3-year lag structures on Opportunity and Necessity Entrepreneurship

Variable	Opportunity Entrepreneurship			Necessity Entrepreneurship		
	Model A1	Model A2	Model A3	Model A4	Model A5	Model A6
Trade Integration <sub>t-1</sub>	0.14** (0.06)			-0.17*** (0.06)		
Trade Integration <sub>t-2</sub>		0.20*** (0.07)			-0.21*** (0.07)	
Trade Integration <sub>t-3</sub>			0.14* (0.08)			-0.15* (0.09)
Economic Development	6.08*** (1.79)	6.78*** (1.91)	6.62*** (2.12)	-5.62*** (1.43)	-5.96*** (1.56)	-5.94*** (1.68)
GDP	0.28 (0.20)	0.33 (0.21)	0.21 (0.23)	-0.22 (0.20)	-0.26 (0.21)	-0.19 (0.24)
FDI	0.04 (0.07)	0.04 (0.07)	0.06 (0.07)	-0.04 (0.07)	-0.05 (0.07)	-0.07 (0.07)
Education	0.11** (0.05)	0.05 (0.05)	0.06 (0.05)	-0.07* (0.04)	-0.05 (0.04)	-0.07* (0.04)
Population	1.53 (1.52)	1.54 (1.55)	2.57* (1.33)	-2.07 (1.38)	-1.73 (1.63)	-2.96* (1.57)
Female	0.80 (1.19)	0.90 (1.25)	0.57 (1.42)	-1.42 (1.15)	-1.33 (1.25)	-0.89 (1.37)
Unemployment	-0.79*** (0.22)	-0.81*** (0.22)	-0.66*** (0.20)	0.89*** (0.20)	0.90*** (0.21)	0.74*** (0.20)
Constant	19.28 (62.05)	18.06 (65.46)	34.48 (73.50)	103.60* (60.11)	98.78 (66.07)	78.32 (70.96)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	439	400	291	439	400	291
Countries	58	56	48	58	56	48
	0.310	0.305	0.303	0.373	0.375	0.371

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors clustered by country between parentheses. Year and Country dummies are not displayed.

**Table A7:** Random-effects Regression estimates for the influence of Trade Integration in 1-, 2-, and 3-year lag structures on Opportunity and Necessity Entrepreneurship, including the mediator Institutional Quality

Variable	Opportunity Entrepreneurship			Necessity Entrepreneurship		
	Model A7	Model A8	Model A9	Model A10	Model A11	Model A12
Trade Integration <sub>t-1</sub>	0.08 (0.06]			-0.11* (0.06)		
Trade Integration <sub>t-2</sub>		0.14* (0.08)			-0.14* (0.07)	
Trade Integration <sub>t-3</sub>			0.05 (0.08)			-0.04 (0.08)
Institutional Quality	4.14*** (1.42)	3.70** (1.57)	4.53*** (1.43)	-4.62*** (1.36)	-4.75*** (1.55)	-5.71*** (1.43)
<i>Indirect Effect</i>	0.06** (0.01)	0.06** (0.01)	0.09** (0.01)	-0.06** (0.01)	-0.07** (0.01)	-0.11*** (0.01)
	[43%]	[30%]	[64%]	[35%]	[33%]	[73%]
Economic Development	4.52** (1.99)	5.47** (2.13)	4.49* (2.32)	-4.17*** (1.36)	-4.56*** (1.48)	-3.93** (1.58)
GDP	0.22 (0.17)	0.27 (0.18)	0.11 (0.20)	-0.16 (0.17)	-0.18 (0.18)	-0.07 (0.20)
FDI	0.04 (0.07)	0.04 (0.07)	0.04 (0.06)	-0.04 (0.07)	-0.04 (0.07)	-0.05 (0.07)
Education	0.10** (0.05)	0.05 (0.05)	0.07 (0.05)	-0.06 (0.04)	-0.05 (0.04)	-0.09** (0.04)
Population	1.47 (1.43)	1.48 (1.46)	2.31** (1.14)	-1.99 (1.25)	-1.61 (1.48)	-2.62** (1.29)
Female	0.36 (1.06)	0.55 (1.15)	-0.07 (1.19)	-0.85 (0.99)	-0.80 (1.13)	-0.18 (1.11)
Unemployment	-0.72*** (0.21)	-0.75*** (0.21)	-0.58*** (0.18)	0.82*** (0.19)	0.84*** (0.21)	0.67*** (0.18)
Constant	12.87 (55.86)	10.17 (60.05)	34.67 (60.69)	107.14** (51.98)	104.90* (59.27)	83.56 (55.07)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	439	400	291	439	400	291
Countries	58	56	48	58	56	48
R <sup>2</sup>	0.351	0.334	0.310	0.421	0.411	0.402

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors clustered by country between parentheses. Year and Country dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets.

**Table A8:** Random-effects Regression estimates for the influence of Trade Integration in 1-, 2-, and 3-year lag structures on Opportunity and Necessity Entrepreneurship, including the moderator Economic Development

Variable	Opportunity Entrepreneurship			Necessity Entrepreneurship		
	Model A13	Model A14	Model A15	Model A16	Model A17	Model A18
Trade Integration <sub>t-1</sub>	0.28*** (0.08]			-0.24*** (0.09)		
Trade Integration <sub>t-2</sub>		0.31*** (0.10)			-0.26*** (0.10)	
Trade Integration <sub>t-3</sub>			0.24** (0.11)			-0.16 (0.10)
Economic Development	9.83*** (3.45)	9.43** (3.69)	9.31** (4.21)	-7.53** (3.03)	-7.38** (3.28)	-6.27* (3.43)
Trade Integration.Economic Development	-0.21 (0.13)	-0.16 (0.14)	-0.17 (0.16)	0.11 (0.12)	0.09 (0.13)	0.02 (0.14)
GDP	0.28 (0.19)	0.33 (0.20)	0.20 (0.23)	-0.22 (0.20)	-0.25 (0.21)	-0.19 (0.24)
FDI	0.05 (0.07)	0.05 (0.07)	0.07 (0.07)	-0.05 (0.07)	-0.05 (0.07)	-0.07 (0.07)
Education	0.10* (0.05)	0.05 (0.05)	0.06 (0.05)	-0.06 (0.04)	-0.05 (0.04)	-0.07* (0.04)
Population	1.79 (1.56)	1.71 (1.61)	2.72** (1.32)	-2.18 (1.42)	-1.81 (1.68)	-2.98* (1.58)
Female	0.33 (1.15)	0.54 (1.20)	0.23 (1.42)	-1.16 (1.13)	-1.12 (1.22)	-0.85 (1.42)
Unemployment	-0.71*** (0.23)	-0.74*** (0.24)	-0.59*** (0.21)	0.85*** (0.22)	0.86*** (0.23)	0.73*** (0.22)
Constant	41.00 (60.20)	34.73 (63.14)	49.60 (73.54)	91.64 (59.14)	89.01 (64.37)	76.70 (73.10)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	439	400	291	439	400	291
Countries	58	56	48	58	56	48
R <sup>2</sup>	0.309	0.303	0.300	0.371	0.371	0.370

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors clustered by country between parentheses. Year and Country dummies are not displayed.

**Table A9:** Random-effects Regression estimates for the influence of Trade Integration on Opportunity and Necessity Entrepreneurship, including additional control variables regarding the population's attitudes towards entrepreneurship

Variable	Opportunity Entrepreneurship			Necessity Entrepreneurship		
	Model A19	Model A20	Model A21	Model A22	Model A23	Model A24
Trade Integration	0.15*** (0.06)	0.11* (0.06)	0.33*** (0.09)	-0.12** (0.05)	-0.07 (0.06)	-0.28*** (0.08)
Institutional Quality		2.83** (1.17)			-3.25*** (1.08)	
<i>Indirect Effect</i>		0.04** (0.01)			-0.05** (0.01)	
		[27%]			[42%]	
Economic Development	6.79*** (1.62)	5.54*** (1.84)	12.51*** (2.99)	-6.64*** (1.20)	-5.39*** (1.19)	-11.60*** (2.55)
Trade Integration.Economic Development			-0.29*** (0.11)			0.25*** (0.09)
GDP	0.15 (0.19)	0.12 (0.18)	0.12 (0.19)	-0.10 (0.19)	-0.06 (0.17)	-0.07 (0.19)
FDI	0.01 (0.05)	0.00 (0.05)	0.02 (0.05)	-0.04 (0.05)	-0.04 (0.05)	-0.05 (0.05)
Education	0.07 (0.05)	0.07 (0.05)	0.06 (0.05)	-0.06 (0.04)	-0.06 (0.04)	-0.05 (0.04)
Population	1.17 (1.37)	1.22 (1.32)	1.47 (1.41)	-1.56 (1.37)	-1.60 (1.29)	-1.79 (1.40)
Female	0.84 (0.94)	0.46 (0.91)	0.35 (0.91)	-1.12 (0.91)	-0.66 (0.86)	-0.68 (0.86)
Unemployment	-0.60*** (0.16)	-0.55*** (0.16)	-0.49*** (0.17)	0.68*** (0.14)	0.62*** (0.14)	0.58*** (0.15)
Career Choice	-0.12* (0.05)	-0.10* (0.05)	-0.10* (0.05)	0.17*** (0.05)	0.15*** (0.05)	0.16*** (0.05)
Fear of Failure	-0.04 (0.08)	-0.04 (0.08)	-0.03 (0.08)	0.01 (0.07)	0.01 (0.08)	0.00 (0.07)
Media Attention	-0.04 (0.06)	-0.05 (0.06)	-0.03 (0.05)	0.09* (0.05)	0.10* (0.05)	0.09* (0.05)
Perceived Opportunities	0.19*** (0.06)	0.18*** (0.06)	0.21*** (0.06)	-0.23*** (0.06)	-0.22*** (0.06)	-0.24*** (0.06)
Constant	22.77 (51.27)	22.96 (48.94)	42.94 (49.81)	81.64* (49.23)	81.05* (46.22)	63.54 (46.76)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	522	522	522	522	522	522
Countries	63	63	63	63	63	63
R <sup>2</sup>	0.377	0.395	0.370	0.472	0.493	0.463

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors between parentheses. Standard errors are clustered by country. Year and Country Dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets.

**Table A10:** Random-effects Regression estimates for the influence of Trade Integration on Total Entrepreneurship and the logarithm of Opportunity-to-Necessity Ratio

Variable	Total Entrepreneurship			Ln (Opportunity-to-Necessity Ratio)		
	Model A25	Model A26	Model A27	Model A28	Model A29	Model A30
Trade Integration	-0.01 (0.02)	-0.00 (0.03)	-0.09 (0.07)	0.01*** (0.00)	0.01 (0.02)	0.02*** (0.00)
Institutional Quality		-0.60 (0.50)			0.22*** (0.06)	
<i>Indirect Effect</i>		-0.01 (0.00)			0.01** (0.00)	
					[100%]	
Economic Development	-3.82*** (1.00)	-3.74*** (0.99)	-6.20*** (2.25)	0.40*** (0.08)	0.33*** (0.08)	0.66*** (0.14)
Trade Integration.Economic Development			0.12 (0.07)			-0.01*** (0.01)
GDP	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
FDI	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Education	0.05** (0.02)	0.05** (0.02)	0.06** (0.02)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)
Population	0.90* (0.50)	0.91* (0.49)	0.77 (0.50)	0.18*** (0.06)	0.18*** (0.06)	0.19*** (0.07)
Female	-0.52 (0.54)	-0.42 (0.57)	-0.27 (0.57)	0.06 (0.05)	0.03 (0.05)	0.04 (0.05)
Unemployment	-0.04 (0.06)	-0.05 (0.06)	-0.08 (0.07)	-0.04*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)
Constant	34.23 (28.49)	33.14 (28.87)	22.33 (28.87)	-2.83 (2.79)	-2.86 (2.56)	-1.61 (2.59)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	583	583	583	583	583	583
Countries	63	63	63	63	63	63
R <sup>2</sup>	0.487	0.489	0.486	0.405	0.402	0.403

Note: \*\*\*  $p$ -value  $\leq 0.01$ , \*\*  $p$ -value  $\leq 0.05$ , \*  $p$ -value  $\leq 0.10$ . Regression coefficients displayed with standard errors clustered by country between parentheses. Year and Country dummies are not displayed. Proportion of the relationship mediated by institutional quality is shown between brackets. The proportion of the relationship between *Trade Integration* and *Total Entrepreneurship* is not shown, since this mediation effect of *Institutional Quality* is insignificant.