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The Travel and Tourism Competitiveness Index: Examining the Reciprocal Relationship among the TTCI Factors Relative to Porter's (1998) Diamond Model and Airline Passenger Seat Capacity for the Countries of the World

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by

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Abstract

TITLE: The Travel and Tourism Competitiveness Index: Examining the Reciprocal Relationship among the TTCI Factors Relative to Porter's (1998) Diamond Model and Airline Passenger Seat Capacity for the Countries of the World

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The current study tested the application of Porter's (1998) diamond model of international competitiveness to the travel and tourism (T&T) industry by examining the relationship among the 14 factors of the travel and tourism competitiveness index (TTCI) to the model's four dimensions. The assignment of TTCI factors to these dimensions was guided by Dwyer and Kim (2003) and Ritchie and Crouch (2010). The study also examined the relationship between TTCI factors and airline passenger seat capacity, which was measured as the per capita annual average of weekly available seat kilometers. The sample comprised 136 countries, which represented 70% of the world's countries, and encompassed 98% of world GDP. TTCI data were acquired from the World Economic Forum's 2017 edition of the Travel and Tourism Competitiveness Report, and airline seat capacity data were acquired from IATA. The study design was explanatory correlational.

MANOVA and univariate follow-up *F* tests confirmed 19 unique reciprocal relationships. All were positive except two. Each dimension also had at least one factor that was part of a significant reciprocal relationship and therefore the findings supported Porter's model. The findings also identified five factors as critical to being competitive in the international travel and tourism industry: Health & Hygiene, Business Environment, Prioritization of Travel & Tourism, International Openness, and Air Transport Infrastructure. A simultaneous hierarchal regression analysis also confirmed that Health & Hygiene, Air Transport Infrastructure, and Prioritization of Travel & Tourism had significant positive relationships with airline seat capacity whereas Environmental Sustainability, Cultural Resources & Business Travel, and Price Competitiveness had significant negative relationships with airline seat capacity.

The findings suggest that promoting travel and tourism can be beneficial to a country's international reputation and yield greater prosperity. To do so, though, countries must give attention to health and hygiene conditions, air transport infrastructure, business environment, and focus on improving international openness.

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Dedication

This dissertation is dedicated to the memory of

my Grandma, Aziza Alnahas.

You have left fingerprints of grace on our lives. You shall not be forgotten.

Chapter 1

Introduction

Background and Purpose

Background. The primary focus of the current study was to apply the factors associated with the travel and tourism competitiveness index (TTCI) to Porter's (1998) diamond theory reciprocal model of international competitiveness as illustrated in Figure 1.1. The study's focus also was to examine the relationship between the TTCI factors and airline passenger seat capacity, which measured as the per capita annual average of weekly available seat kilometers.

According to the World Travel and Tourism Council (WTTC, 2019), the global travel and tourism (T&T) industry in 2018 accounted for an estimated $8.8 trillion of GDP, which comprised 10.4% of the world's total GDP and 6.5% of world exports. The T&T industry also plays a key role for growth and job creation, employing 319 million people and contributing 10% of total employment, which is expected to increase to 11.2% by 2026. Furthermore, using World Tourism Organization data, Calderwood and Soshkin, (2019) reported that 2018 was the 7th consecutive year where growth in tourism exports exceeded growth in merchandise exports: a 4% vs. 3% increase. Calderwood and Soshkin also reported that worldwide the number of international tourist arrivals reached 1.4 billion, 2 years before it was predicted to do so, and therefore based on this pace of growth, the current projection of 1.8 billion international arrivals by 2030 may be conservative.

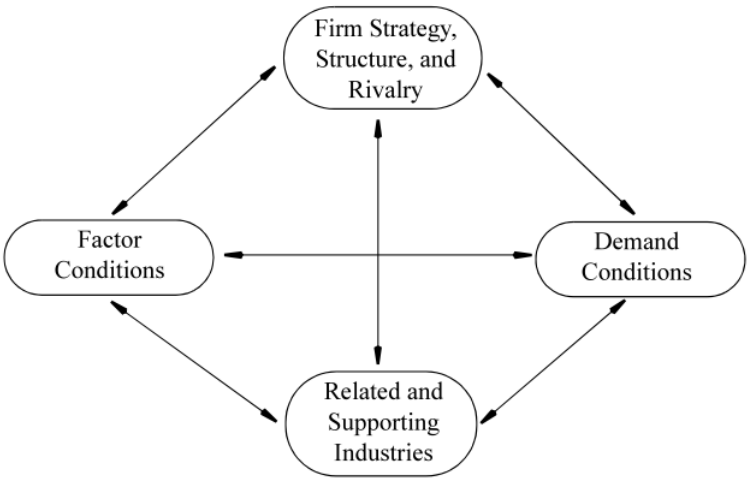


***Figure 1.1*. Porter's (1998) diamond theory reciprocal model.**

These estimates show that travel and tourism has a pronounced impact on the world economy relative to high share of output, quantity of value added, employment, exports, and tax contribution. As a result, studying the factors that lead to competitiveness in the T&T industry can help corporate and government decision makers to further increase prosperity by optimizing travel and tourism productivity.

The T&T industry also makes an excellent arena for the study of international competitiveness because it is, almost by definition, a globalized industry heavily utilizing international trade, especially when considering the way it is driven by the airline industry. Indeed, the airline industry, itself a subset of the T&T industry, makes up an important cluster for any economy because it plays a pivotal role in national competitiveness. For example, Morphet and Bottini (2013, p. 11) reported that air connectivity "is key to unlocking a country's economic

growth potential, in part because it enables the country to attract business investment and human capital. An increase in air connectivity also spurs tourism, which is vital to many countries' economic prosperity." The airline industry also plays a large role in the global economy. Airlines make up 1% of world GDP through 8.3 trillion total annual revenue passenger kilometers (distance flown per paying passenger) that were traveled in 2018 globally through 4.4 billion passenger departures (IATA, 2019). In 2018, $845 billion was spent worldwide on airline passenger flights (IATA, 2019).

The current study hinged on the concept of international competitiveness, defined by prominent economics and business strategist Michael Porter as the ability of a country to produce goods and services that meet the requirements of international markets and, at the same time, maintain and increase the real income and welfare of its citizens (1990). As observed by Porter (1990):

> The only meaningful concept of competitiveness at the national level is productivity. The principal goal of a nation is to produce a high and rising standard of living for its citizens. The ability to do so depends on the productivity with which a nation's labor and capital are employed. Productivity is the value of the output produced by a unit of labor or capital…. Seeking to explain "competitiveness" at the national level, then, is to answer the wrong question. What we must understand instead is the determinants of productivity and the rate of productivity growth. To find

answers, we must focus not on the economy as a whole but on specific industries and industry segments. (p. 76)

In his book, *Competitive Advantage of Nations,* Porter (1998) detailed a theoretical model that could help one understand the position of a nation in global competition within any specific industry. As illustrated in Figure 1.1, this model consists of four main dimensions (described below) that reciprocally influence each other. As a point of information to the reader, Porter's model is referred to in this dissertation as Porter's "diamond theory" or "diamond model," which describes the shape of the model and the mutually reinforcing relationships among these four dimensions. According to Porter's diamond theory, the quality of the home country environment—as described by these four dimensions—influences how successful that country's industry, or companies within that country's industry, can become in other markets.

The current study's research problem thereby emerged out of government and T&T industry leaders' need for insight into how to most effectively improve their countries' international competitiveness in the important and growing T&T industry. Concurrently, airline industry leaders need insight into where they can grow airline traffic in the future and how to most effectively do so. The current study was grounded in Porter's (1998) diamond model in order to meet these needs.

Porter's (1998) model was selected because it deals with international competitiveness of nations' industries in general, whereas other models—for

example, Dwyer and Kim (2003), Dwyer, Mellor, Livaic, Edwards, and Kim (2004), and the model implicit in the TTCI (World Economic Forum, 2017a)—focused specifically on international competitiveness of nations' T&T industries. Using Porter's model, the current study's results may be compared to similar studies of other industries in the future, while industry-specific models do not lend themselves to such comparisons. A final benefit of the current study is that it investigated the validity of Porter's (1998) diamond theory reciprocal model with both quantifiable data and a real-world non-financial measure.

Although prior studies have qualitatively applied Porter's (1998) diamond model to the T&T industry, no research has quantitatively investigated the mutual reinforcement or relationship between the contributing factors to international competitiveness in the T&T industry with respect to Porter's model. In fact, most of the relevant studies have focused on factors that contributed to international competitiveness in the T&T industry in only certain countries (Alhowaish, 2016; Bayramoglu, 2015; Crouch & Ritchie, 1999; Gokovali, 2010; Kibara, Odhiambo, & Njuguna, 2012; Mak, 2008; Sanchez-Canizares & Castillo-Canalejo, 2015; Tugcu, 2014) or their association with financial and macroeconomic measures such as economic growth, employment, and GDP (Brida & Risso, 2010; Crouch & Ritchie, 1999; Dwyer, Forsyth, & Dwyer, 2009; Gokovali, 2010; Kim, 2012; Seetanah, 2011; Sinclair, 1998; Webster & Ivanov, 2014).

Validating competitiveness models with financial and macroeconomic measures, however, is vulnerable to confounding factors such as exchange rates, purchasing power parity, and national accounting issues. There is a need for a more objective and independent way to measure the results of competitiveness and to do so beyond the confines of only certain countries. The current study accomplished these goals by using a real-world non-financial indicator of airline activity to compare the productivity of countries' T&T industries against each other.

Purpose. The purpose of the current study was twofold. The first part (Part A) was to determine the extent to which the four dimensions of Porter's (1998) diamond model of international competitiveness can be applied to the T&T industry by quantifying the level of reciprocality of influence in the relationship between each dimension. The second part (Part B) was to examine the relationship between the factors that contribute to a country's international competitiveness in the T&T industry and the per capita passenger capacity of the combined domestic and international airline flights originating within that country.

As illustrated in Figure 1.1, the four dimensions, or determinants, of Porter's (1998) model are (a) Factor Conditions; (b) Firm Strategy, Structure, and Rivalry; (c) Demand Conditions; and (d) Related and Supporting Industries. The data used to examine the relationships among these dimensions were acquired from the 2017 Travel and Tourism Competitiveness Index (TTCI) for the countries of the world as found in the 2017 Travel and Tourism Competitiveness Report

(TTCR), which was produced by the World Economic Forum (WEF, 2017a). The countries studied are listed in Table 1.1 relative to their corresponding regions.

In the context of the current study, the contributing factors to international competitiveness in the T&T industry were defined as a country's scores on the 14 factors that comprise the TTCI. As illustrated in Figure 1.2, these 14 factors were partitioned in the TTCR into four main subindexes—(a) Enabling Environment, (b) T&T Policy and Enabling Conditions, (c) Infrastructure, and (d) Natural and Cultural Resources—and each subindex consisted of a set of factors.

However, for the current study, the 14 TTCI factors were reorganized into sets that corresponded to the four dimensions of Porter's (1998) diamond theory model. Each dimension of Porter's model was then examined to determine the

Table 1.1
Countries Covered by the TTCI

Europe and Eurasia Region (*N* = 46)				
Southern Europe (N = 8)	***Western Europe (N = 10)***	***Northern Europe (N = 8)***	***Balkans and Eastern Europe (N = 12)***	***Eurasia (N = 8)***
Spain	France	Norway	Slovenia	Russian Federation
Italy	Germany	Sweden	Bulgaria	Georgia
Portugal	United Kingdom	Iceland	Poland	Azerbaijan
Greece	Switzerland	Denmark	Hungary	Kazakhstan
Croatia	Austria	Finland	Slovak Republic	Armenia
Malta	Netherlands	Estonia	Romania	Ukraine
Turkey	Belgium	Latvia	Montenegro	Tajikistan
Cyprus	Ireland	Lithuania	Macedonia, FYR	Kyrgyz Republic
	Luxembourg		Serbia	
	Czech Republic		Albania	
			Bosnia and Herzegovina	
			Moldova	

Table 1.1

Countries Covered by the TTCI (Continued)

The Americas Region (*N* = 23)		**Middle East and North Africa Region (*N* = 15)**	
North and Central America (N = 13)	***South America (N = 10)***	***Middle East (N = 11)***	***North Africa (N = 4)***
United States	Brazil	United Arab Emirates	Morocco
Canada	Chile	Qatar	Egypt
Mexico	Argentina	Bahrain	Tunisia
Panama	Peru	Israel	Algeria
Costa Rica	Ecuador	Saudi Arabia	
Barbados	Colombia	Oman	
Jamaica	Uruguay	Jordan	
Trinidad and Tobago	Bolivia	Iran, Islamic Rep.	
Dominican Republic	Venezuela	Lebanon	
Guatemala	Paraguay	Kuwait	
Honduras		Yemen	
Nicaragua			
El Salvador			

Sub-Saharan Africa Region (*N* = 30)					
Southern Africa (N = 6)	***Eastern Africa (N = 11)***		***Western Africa (N = 13)***		
South Africa	Mauritius	Madagascar	Cape Verde	Benin	
Namibia	Kenya	Mozambique	Côte d'Ivoire	Nigeria	
Botswana	Tanzania	Malawi	Senegal	Mali	
Zambia	Rwanda	Congo, Democratic	Gambia, The	Sierra Leone	
Zimbabwe	Uganda	Rep.	Gabon	Mauritania	
Lesotho	Ethiopia	Burundi	Ghana	Chad	
			Cameroon		

Asia and the Pacific Region (*N* = 22)				
Eastern Asia and Pacific N = 8)		***Southeast Asia (N = 9)***		***South Asia (N = 5)***
Japan	New Zealand	Singapore	Vietnam	India
Australia	Korea, Rep.	Malaysia	Philippines	Bhutan
Hong Kong	Taiwan, China	Thailand	Lao PDR	Nepal
SAR	Mongolia	Indonesia	Cambodia	Pakistan
China		Sri Lanka		Bangladesh

extent to which it influences the other three dimensions, and furthermore, which factor(s) within each dimension have a reciprocal relationship with factors in the other dimensions. This set of relationships is illustrated in Figure 1.3.

Figure 1.2. **The 14 factors of the Travel and Tourism Competitiveness Index (TTCI). (*Source*: World Economic Forum, 2017a).**

It is important to emphasize there were two primary differences between the model of international competitiveness implicit in the TTCI (World Economic Forum, 2017a) and Porter's (1998) model: the TTCI model did not reflect the reciprocal nature of the relationships among dimensions as posited by Porter, and the theoretical justification for the design of the TTCI was left unstated (World Economic Forum, 2017a). These differences highlight the need for the current study.

With respect to the current study's second purpose, the 14 TTCI factors were examined from a predictive perspective to determine the extent to which they could be associated with a real-world non-financial indicator of airline activity to compare the productivity of countries' T&T industries against each other. The

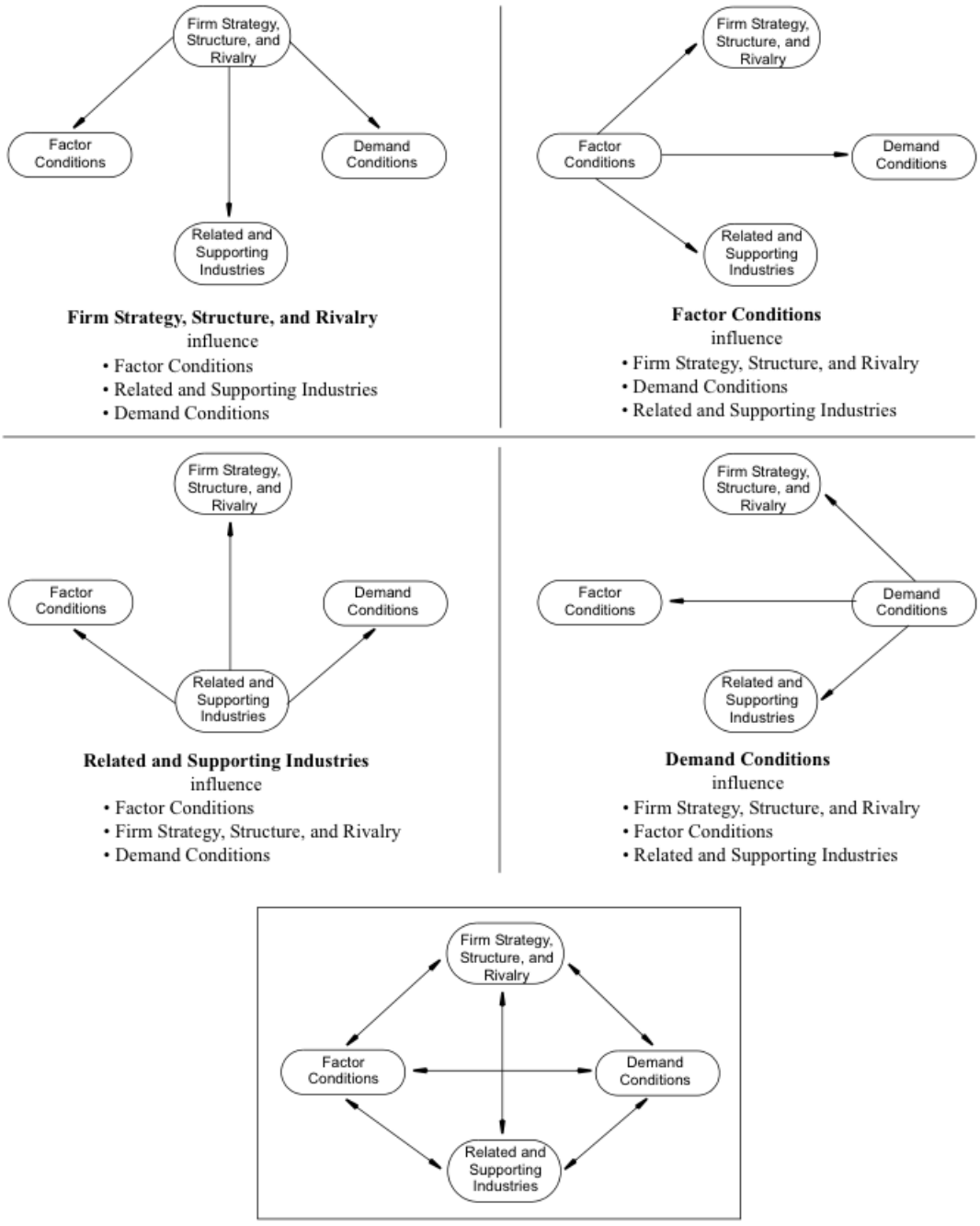


Figure 1.3. Expanded view of Porter's (1998) diamond theory reciprocal model, which posits that each dimension of the model influences the other three. This reciprocal causal relationship among the dimensions generally is illustrated as given in the boxed central figure with bidirectional arrows.

indicator of airline activity chosen was the per capita passenger capacity of airline flights originating in a country, both domestic and international combined, specifically defined as the per capita annual average of weekly available seat kilometers (PCAAWASK) of each flight.

This measure was a summed and averaged index based on a simpler measure commonly used in the airline industry, namely, available seat kilometers (ASK). An ASK for a particular flight is the product of the total number of passenger seats available on the aircraft and the total number of kilometers flown on the flight. For example, an aircraft with 100 seats that flies 250 km generates 25,000 ASK in that flight. The weekly sum of ASK for all flights originating in a particular country, both domestic and international combined, taken by all airlines, was calculated for each week of the year and then averaged, resulting in that country's annual average of weekly available seat kilometers (AAWASK). Finally, because of disparate population sizes among countries, a per capita figure was determined by dividing AAWASK for each country in a given year by the country's population in that year, resulting in per capita annual average of weekly available seat kilometers (PCAAWASK).

To illustrate the calculation and real-world significance of PCAAWASK, in 2014, the total AAWASK for all airline flights originating in the U.S. was 34.06 billion km (International Air Transport Association [IATA], 2015). At a population of 318.9 million people in the U.S. (U.S. Central Intelligence Agency, 2015) in that

year, those airlines had PCAAWASK of 106.83 kilometers per person per week on average over the year. For example, if only people living in the U.S. took those flights, then in 2014, each person in the U.S. traveled an average of 106.83 kilometers per week on airline flights originating in the U.S. Although this example is not true, it illustrates the real-world significance of the figure and the necessity to remove the confounding factor of population.

For the current study, PCAAWASK was selected as a dependent variable because it is a direct measure of productivity that can increase with improved economies of scale. For instance, higher ASK figures can result from larger aircraft and more efficient airline operations, which would allow more frequent and longer flights. Furthermore, ASK data, and concomitantly PCAAWASK, are widely available and reliable, and can be used to help the airline industry to better identify, predict, and plan for future traffic growth.

In summary, competitiveness of a country or an industry can be measured and is an important indicator of its well-being, while airlines in particular and the T&T industry in general are vital clusters to any country's economic growth and competitiveness. No previous study has examined the mutual relationships among the determinants of international competitiveness in the T&T industry and the relationship between international competitiveness in the T&T industry and PCAAWASK. The current study endeavored to help establish these relationships by applying Porter's (1998) diamond theory to the T&T industry using TTCI data

and examining the effects of the factors of competitiveness of each country's T&T industry on a measure of productivity, PCAAWASK. Thus, the current study examined the mutual influence of the determinants of competitiveness on each other and the relationship between the TTCI factors and the per capita passenger capacity of the airline flights originating there, both domestic and international combined.

Definition of Terms

The key terms or phrases relative to the current study were operationally defined as follows:

1. *Air transport infrastructure* was one of three factors that comprised the Infrastructure subindex of the TTCI model (Figure 1.2) and included six indicators: quality of air transport infrastructure, available domestic seat kilometers, available international seat kilometers, aircraft departures, airport density, and number of operation airlines. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.
2. *Available seat kilometers* (ASK) is a measure of an airline flight's passenger capacity. It is equal to the number of seats available

multiplied by the number of kilometers flown. For an example, the reader is directed to the sample calculation that was provided earlier.

3. *Business environment* was one of five factors that comprised the Enabling Environment subindex of the TTCI model (Figure 1.2) and consisted of 12 indicators: property rights, impact of rules on foreign direct investment (FDI), efficiency of legal framework in settling disputes, efficiency of legal framework in challenging regulations, time required to deal with construction permits, cost to deal with construction permits, extent of market dominance, time required to start a business, cost to start a business, extent and effect of taxation on incentives to work, extent and effect of taxation on incentives to invest, and total tax rate. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.
4. *Countries of the world* were defined as the 136 countries listed in the 2017 TTCI and for which there were TTCI scores available. A list of these countries is provided in Table 1.1.
5. *Cultural resources and business travel* was one of two factors that comprised the Natural and Cultural Resources subindex of the TTCI model (Figure 1.2) and included five indicators: number of world

heritage cultural sites, number of oral and intangible cultural heritage expressions, number of sports stadiums, number of international association meetings, and cultural and entertainment tourism digital demand. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

6. *Demand conditions* was one of the four determinants of Porter's (1998) diamond model (Figure 1.1) and referred to the size and nature of the consumer base for products/services, which also drove innovation and product improvement.
7. *Enabling environment* was a subindex of the TTCI model (Figure 1.2) that reflected the foundations of business operations in a country. This subindex was comprised of five factors: Business Environment, Safety and Security, Health and Hygiene, Human Resources and Labor Market, and ICT Readiness. Each of these factors is defined separately in this section and was represented in the corresponding dimension in Porter's (1998) diamond model (Figure 1.1).
8. *Environmental sustainability* was one of four factors that comprised the T&T Policy and Enabling Conditions subindex of the TTCI model (Figure 1.2) and was comprised of 10 indicators: stringency of

environment regulations, enforcement of environmental regulations, sustainability of travel and tourism industry development, particulate matter (2.5) concentration, number of environmental treaty ratifications, baseline water stress, threatened species, forest cover change, wastewater treatment, and coastal shelf fishing pressure. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

9. *Factor conditions* was one of the four determinants in Porter's (1998) diamond model (Figure 1.1). According to Porter, Factor Conditions are also called "factors of production," which are the necessary inputs for a country to compete in any industry, such as a large pool of skilled labor, technological innovation, infrastructure, and capital.
10. *Firm strategy, structure, and rivalry* was one of the four determinants of Porter's (1998) diamond model (Figure 1.1) and referred to the way in which companies within a particular industry are created, set goals, and are managed, all of which are important for success. However, the presence of intense rivalry in the home base also is important; it creates pressure to innovate in order to upgrade competitiveness. For example,

Swedish strength in fabricated steel products, such as ball bearings and cutting tools, has drawn on strength in specialty steels.

11. *Ground and port infrastructure* was one of three factors that comprised the Infrastructure subindex of the TTCI model (Figure 1.2) and consisted of seven indicators: quality of roads, road density, paved road density, quality of railroad infrastructure, railroad density, quality of port infrastructure, and ground transport efficiency. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.
12. *Health and hygiene* was one of the five factors that comprised the Enabling Environment subindex of the TTCI model (Figure 1.2) and consisted of six indicators: physician density, access to improved sanitation, access to improved drinking water, hospital beds, HIV prevalence, and malaria incidence. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

13. *Human resources and labor market* was one of five factors that comprised the Enabling Environment subindex of the TTCI model (Figure 1.2) and consisted of nine indicators: primary education enrolment rate, secondary education enrolment rate, extent of staff training, treatment of customers, hiring and firing practices, ease of finding skilled employees, ease of hiring foreign labor, pay and productivity, and female labor force participation. The data for these five indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.
14. *ICT readiness* was one of five factors that comprised the Enabling Environment subindex of the TTCI model (Figure 1.2) and consisted of eight indicators: ICT use for business-to-business transactions, Internet use for business-to-consumer transactions, individuals using the Internet, broadband internet subscribers, mobile telephone subscriptions, mobile broadband subscriptions, mobile network coverage, and quality of electricity supply. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an

average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

15. *Infrastructure* was a subindex of the TTCI model (Figure 1.2) that described the availability and quality of the physical infrastructure of each economy. This subindex was defined by three factors: Air Transport Infrastructure, Ground and Port Infrastructure, and Tourist Service Infrastructure. Each of these three factors is defined separately in this section and also was represented in the corresponding dimension in Porter's (1998) diamond theory reciprocal model (Figure 1.1).
16. *International competitiveness in the T&T industry* was defined as the ability of a country to produce goods and services in the T&T industry that meet the requirements of international markets and, at the same time, maintain and increase the real income and welfare of its citizens. In the context of the current study, the contributing factors to international competitiveness in the T&T industry were defined as a country's scores on the 14 factors that comprise the TTCI as found in the 2017 Travel and Tourism Competitiveness Report (TTCR), which was produced by the World Economic Forum (2017a).
17. *International openness* was one of four factors that comprised the T&T Policy and Enabling Conditions subindex of the TTCI model (Figure 1.2) and consisted of three indicators: visa requirements, openness of

bilateral air service agreements, and number of regional trade agreements in force. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

18. *Natural and cultural resources* was a subindex of the TTCI model (Figure 1.2). Thus, subindex described the principal reasons to travel and was defined by two factors: Natural Resources and Cultural Resources and Business Travel. Each of these two factors is defined separately in this section and was represented in the corresponding dimension in Porter's (1998) diamond model (Figure 1.1).
19. *Natural resources* was one of two factors that comprised the Natural and Cultural Resources subindex of the TTCI model (Figure 1.2) and consisted of five indicators: number of world heritage cultural sites, total known species, total protected areas, natural tourism digital demand, and attractiveness of natural assets. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

20. *Per capita annual average of weekly available seat kilometers* (PCAAWASK) was a measure of passenger airline capacity in a country. It was summed and averaged figure based on Available Seat Kilometers (ASK). The weekly sum of ASK for all flights originating in a particular country, both domestic and international combined, taken by all airlines, was calculated for each week of the year and then averaged, resulting in that country's Annual Average of Weekly Available Seat Kilometers (AAWASK). Because of disparate population sizes among countries, a per capita figure was determined by dividing AAWASK for each country in a given year by the country's population in that year, resulting in PCAAWASK. For an example, the reader is directed to the sample calculation that was provided earlier.
21. *Price competitiveness* was one of four factors in T&T Policy and Enabling Conditions subindex of the TTCI model (Figure 1.2) and consisted of four indicators: ticket taxes and airport charges, hotel price index, purchasing power parity, and fuel price levels. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

22. *Prioritization of travel & tourism* was one of four factors in T&T Policy and Enabling Conditions subindex of the TTCI model (Figure 1.2) and consisted of six indicators: government prioritization of the T&T industry, T&T government expenditure, effectiveness of marketing to attract tourists, comprehensiveness of annual T&T data, timeliness of providing monthly/quarterly T&T data, and country brand strategy rating. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.
23. *Related and supporting industries* was the third determinant of Porter's (1998) diamond theory reciprocal model (Figure 1.1) and referred to upstream and downstream industries that facilitate innovation through exchanging ideas. Related and supporting industries can produce inputs that are important for innovation and internationalization. These industries provide cost-effective inputs, but they also participate in the upgrading process, thus stimulating other companies in the chain to innovate. For example, the tourism industry could support the hotel and airlines industries.
24. *Safety and security* was one of five factors in the Enabling Environment subindex of the TTCI model (Figure 1.2) and consisted of five

indicators: business costs of crime and violence, reliability of police services, business costs of terrorism, index of terrorism incidents, and homicide rate. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.

25. *Tourist service infrastructure* was one of three factors in the Infrastructure subindex of the TTCI model (Figure 1.2) and consisted of four indicators: hotel rooms, quality of tourism infrastructure, presence of major car rental companies, and automated teller machines per adult population. The data for these indicators were derived from the Executive Opinion Survey as well as statistical data from other organizations. The score for each factor in the TTCI model was an average of its indicators and measured on a scale from 1 to 7, with 7 being the most competitive.
26. *T&T policy and enabling conditions* was a subindex of the TTCI model (Figure 1.2) that captured specific policies or strategic aspects impacting the T&T industry more directly in a country. This subindex was defined by four factors: Prioritization of Travel and Tourism, International Openness, and Price Competitiveness, and Environment Sustainability.

Each of these factors is defined separately in this section and was also represented in the four dimensions of Porter's (1998) diamond model (Figure 1.1).

Research Questions and Hypotheses

Research questions. Two research questions guided the current study:

Research question 1. What is the relationship between the travel and tourism competitive index data for the countries of the world and Porter's (1998) diamond model of international competitiveness (Figure 1.1)?

Research question 2. What is the relationship between the 14 factors of the travel and tourism competitive index and the per capita passenger capacity of the combined domestic and international airline flights originating within that country?

Research hypotheses. The corresponding research hypotheses, which were deduced from Porter's (1998) diamond model (Figure 1.1), were as follows:

Hypothesis 1a. At least one TTCI factor in the Factor Conditions dimension in Porter's (1998) model will have a reciprocal relationship with at least one TTCI factor in each of the other three dimensions: Demand Conditions; Related and Supporting Industries; and Firm Strategy, Structure, and Rivalry.

Hypothesis 1b. At least one TTCI factor in the Firm Strategy, Structure, and Rivalry dimension in Porter's (1998) model will have a reciprocal relationship with at least one TTCI factor in each of the other three dimensions: Factor Conditions, Demand Conditions, and Related and Supporting Industries.

Hypothesis 1c. At least one TTCI factor in the Demand Conditions dimension in Porter's (1998) model will have a reciprocal relationship with at least one TTCI factor in each of the other three dimensions: Factor Conditions; Firm Strategy, Structure, and Rivalry; and Related and Supporting Industries.

Hypothesis 1d. At least one TTCI factor in the Related and Supporting Industries dimension in Porter's (1998) model will have a reciprocal relationship with at least one TTCI factor in each of the other three dimensions: Factor Conditions; Firm Strategy, Structure, and Rivalry; Demand Conditions.

Hypothesis 2. There will be a relationship between the factors of a country's international competitiveness in the T&T industry and the per capita annual average of weekly available seat kilometers (PCAAWASK).

Study Design

The research design for the current study was explanatory correlational. This design was appropriate because the study involved examining relationships among multiple factors associated with a single group, namely, the countries of the world. This design describes in quantitative terms the degree to which variables are related and helps to examine the nature of the relationship among variables, including the strength, direction, and form (Locks, Silverman, & Spirduso, 2010).

Significance of the Study

A major contribution of the current study is that it was the first to apply Porter's (1998) diamond model to a segment of the aviation industry (passenger

airlines) and the T&T industry while measuring T&T competitiveness quantitatively. The current study thereby developed a new strategy for analyzing and understanding the aviation and T&T industries. It was also the first to examine the relationship between Porter's model (in this case, using TTCI factors to quantitatively express that model) and an airline performance measure as a means of measuring productivity. Additionally, it was the first to apply Porter's model to the T&T industry for all the countries of the world (as opposed to only one or a handful of countries).

Furthermore, the current study also benefits the business and economics research community by opening the door to further research on how to understand and measure international competitiveness and its determinants, in general. It benefits the aviation and T&T research communities by shedding light on these aspects of the T&T industry, specifically. The current study also opened the door to subsequent research on how these topics relate to airline passenger flight capacity, as no other studies were found that investigated competitiveness in the T&T industry with respect to PCAAWASK or similar measures.

As described in Chapter 4 and Chapter 5, the results of the study identify specific factors that countries, governments, and airlines can target to foster and increase their T&T international competitiveness. Also, the results increase understanding of the nature of the relationships the between the TTCI factors and between those factors and airline passenger seat capacity.

In terms of generalizability, because the current study's sample was a census of the accessible population, the results are generalized to the accessible population. The current study's findings may also generalizable to the target population because the countries that comprised the sample represented 70% of the countries of the world and encompassed 98% of world GDP (World Economic Forum, 2017b). Furthermore, although the current study's results were restricted to the T&T industry, the results of the current study may be applied to other industries. This is because the same industry factors—particularly the TTCI factors that comprised the Factor Conditions dimension of Porter's model—are likely to be at play in other time periods. This is further elaborated in Chapter 5.

Study Limitations and Delimitations

As noted above as well as in Chapter 5, the findings of the current study have relatively high external validity (both population and ecological generalizability). However, the generalizability of the findings are still bounded by the limitations and delimitations inherent within the current study. A brief description of these limitations and delimitations follows.

Limitations. Limitations are factors such as conditions, influences, or circumstances that lie outside of a researcher's control. These conditions, influences, or circumstances have the potential to limit the generalizability of a study's results. The limitations of the current study are given here and the reader is

advised to consider any conclusions or inferences emanating from the study's results with respect to these limitations.

1. Data sources and integrity. The current study relied on archival data stored in publicly accessible databases. For example: (a) scores relative to the international competitiveness in the T&T industry were acquired from the WEF's (2017a) TTCI methodology; (b) the calculation of PCAAWASK was based on data reported by the aviation authority of each country and/or various industry statistical reporting outlets and/or the airlines themselves, depending on the country (WEF, 2017a); and (c) the population statistics for the per capita calculations came from various sources including census bureaus (WEF, 2017a). Because I had no control over the record keeping of the data collection instruments or the integrity of the data that were collected and stored in the databases, data integrity could be problematic. It also is possible that the archived data were subject to a history threat to internal validity as presented in Chapter 3. As a result, subsequent studies similar to the current one that use different data sources, are able to confirm the integrity of the data they use, or control for possible history threats might get different results.

2. Excluded and included countries. The 2017 Travel and Tourism Competitiveness Report (TTCR) excluded certain countries that were in the previous 2015 TTCR. Additionally, the 2017 TTCR included new countries that were not in the 2015 TTCR. As a result, similar studies that use the 2015 TTCR or

any previous or subsequent edition of the TTCR that do not include the same N = 136 countries of the world used in the current study might obtain different results.

Delimitations. The delimitations of a study are factors such as conditions, influences, or circumstances that a researcher imposes to make the study feasible to implement. These additional restrictions are needed from a practical perspective but have the potential to further limit the generalizability of the results. The delimitations of the current study are given here, and the reader is advised to consider any conclusions or inferences emanating from the study's results with respect to these delimitations.

1. Theoretical grounding. The current study was grounded in Porter's (1998) diamond theory reciprocal model of international competitiveness applied to the T&T industry using data from the 2017 TTCR. This study was specifically designed to (a) determine the extent to which the TTCI factors reflected reciprocal relationships as given in Figure 1.1 relative to the four determinants of Porter's model, and (b) to examine the relationship the TTCI factors had with airline seat capacity as a measure of productivity relative to Porter's model. As a result, subsequent studies similar to the current one that are grounded in a different model of competitiveness might yield different results.

2. Research methodology. The research methodology of the current study was correlational, and the results of the study were applied to help explain or predict the relationships across all four dimensions of Porter's (1998) model: Factor

Conditions; Demand Conditions; Firm Strategy, Structure, and Rivalry; and Related and Supporting Industries. As a result, subsequent studies similar to the current one that use a different methodology such as structured equation modeling (SEM), a qualitative approach, or mixed methods might get different results.

3. Measurements of international competitiveness and airline activity. The current study used data from the Travel and Tourism Competitiveness Index (TTCI) to measure international competitiveness. As a result, subsequent studies similar to the current one that use a different measure of international competitiveness such as the International Management Development's World Competitiveness Yearbook, International Federation of Commerce's Business Competitiveness—Ease of Doing Business Report, and the WEF's Global Competitiveness Report (GCI), might get different results.

4. Measurement of airline industry activity. The current study used airline seat capacity as a measure of airline industry activity, which itself was a measure of productivity. Seat capacity was calculated on a per capita annual average of weekly available seat kilometers (PCAAWASK) of each flight. As a result, subsequent studies similar to the current one that use a different measure of airline industry activity—such as number of passengers, flight miles, airline revenues, airline profits or margin, or other profitability ratios—or use a different calculation methodology might get different results.

5. Per capita GDP. As noted above, airline seat capacity as a measure of productivity for each country was chosen as the current study's dependent variable for Research Question 2. An alternative dependent variable could have been per capita real GDP (adjusted for inflation). Thus, subsequent studies similar to the current one that use this alternative dependent variable (or another one) might get different results.

6. Timeframe. The current study was based on the 2017 TTCI report and hence represented a cross-sectional study. This means that subsequent studies similar to the current one that use the TTCI report from a different year might get different results.

7. Grouping of TTCI factors to Porter's dimensions. The current study relied on Dwyer and Kim (2003) and Ritchie and Crouch (2010) to group the TTCI factors with respect to the four dimensions of Porter's (1998) model. Therefore, subsequent studies similar to the current one that use a different grouping source or use a different approach to classifying the factors might not get the same results.

8. Transposition of airline seat capacity data. The PCAAWASK data were highly skewed right and were subsequently transposed using Log base 10 to satisfy the linearity and normality assumptions of regression (see Chapter 4). This resulted in an interpretation of the results relative to the median. As a result, subsequent studies similar to the current one that do not transpose airline passenger seat capacity data might not get the same results.

9. Presence of outliers. As noted in Chapter 4, an outlier analysis using Jackknife distances flagged several outliers in both parts A and B of the current study. These outliers reflected rare cases and not contaminants. Because of the prominence of these rare-case countries on the world stage— for example, both Canada and China are economic world powerhouses, and UAE's airport is once the busiest airport in the world—these outliers were retained and not eliminated. As a result, subsequent studies similar to the current one that do not include the outliers in the final analysis might not get the same results.

Chapter 2

Review of Related Literature

Introduction

This chapter contains three sections. The first section provides a discussion of Porter's (1998) diamond model of international competitiveness, the theoretical foundation on which the current study is grounded and from which the research questions and hypotheses were derived. The second section is a review of past research relevant to the current study. The last section is a summary of the major findings of these prior studies and their implications to the current study.

Overview of Underlying Theoretical Framework

As noted in Chapter 1, the purpose of the current study was to (a) determine the extent to which the four dimensions of Porter's (1998) diamond model of international competitiveness can be applied to the travel and tourism (T&T) industry, and (b) examine the relationship between the TTCI factors and airline passenger seat capacity, which measured as the per capita annual average of weekly available seat kilometers. Porter's diamond model represents an economic model that organizations can use to help understand their competitive position in global markets. Porter's model initially was provided in Chapter 1, Figure 1.1, but is replicated here in Figure 2.1 for the convenience of the reader. This section first explains Porter's model and then explains how the current study's research questions and hypotheses were derived from this theoretical model.

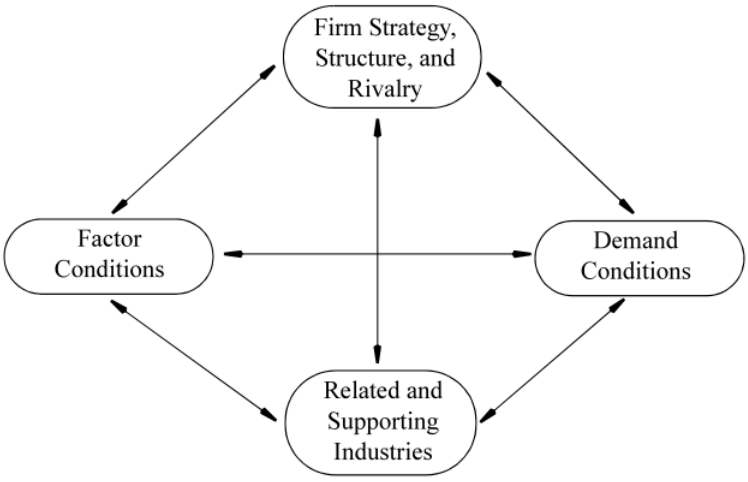


***Figure 2.1*. Porter's (1998) diamond theory reciprocal model.**

Porter's (1998) diamond model. Porter's model posits that the home base of an organization can influence how successful or competitive that country's industry, or organizations within that country's industry, can become globally. This implies that the quality of a home country's environment either can support an organization in enhancing its ability to compete globally or hinder the organization from building advantages in global competition. According to Porter (p. 77):

> The home base is the nation in which the essential competitive advantages of the enterprise are created and sustained. It is where a company's strategy is set, where the core product and process technology is created and maintained, and where the most productive jobs and most advanced skills are located. The presence of the home base in a nation has the greatest positive influence on other linked domestic industries and leads to other benefits in the nation's economy.

Porter (1998) also indicated that understanding what it means for a company to be competitive is clear, but understanding what it means for a country to be competitive is not as clear. Instead of focusing on the economy as a whole, Porter argued that the focus instead should be on specific industries and industry segments: "We must understand how and why commercially viable skills and technology are created, which can only be fully understood at the level of particular industries" (p. 77).

When examined in the context of the first part of the current study (Part A), the targeted industry that was examined was the T&T industry, and the factors associated with each country that could influence the country's global competitiveness were the 14 factors that comprised the Travel and Tourism Competitiveness Index (TTCI). These 14 factors were applied to the aviation industry by examining their relationship with the per capita passenger capacity of the combined domestic and international airline flights originating within the targeted countries. Figure 2.2 provides a graphical illustration of how these factors related to Porter's (1998) diamond model. The assignment of these factors to the four dimensions of Porter's diamond model was based on Porter, Dwyer and Kim (2003), and Ritchie and Crouch (2010). What follows is both a general description of each dimension of Porter's diamond model and how the TTCI factors were assigned to these dimensions.

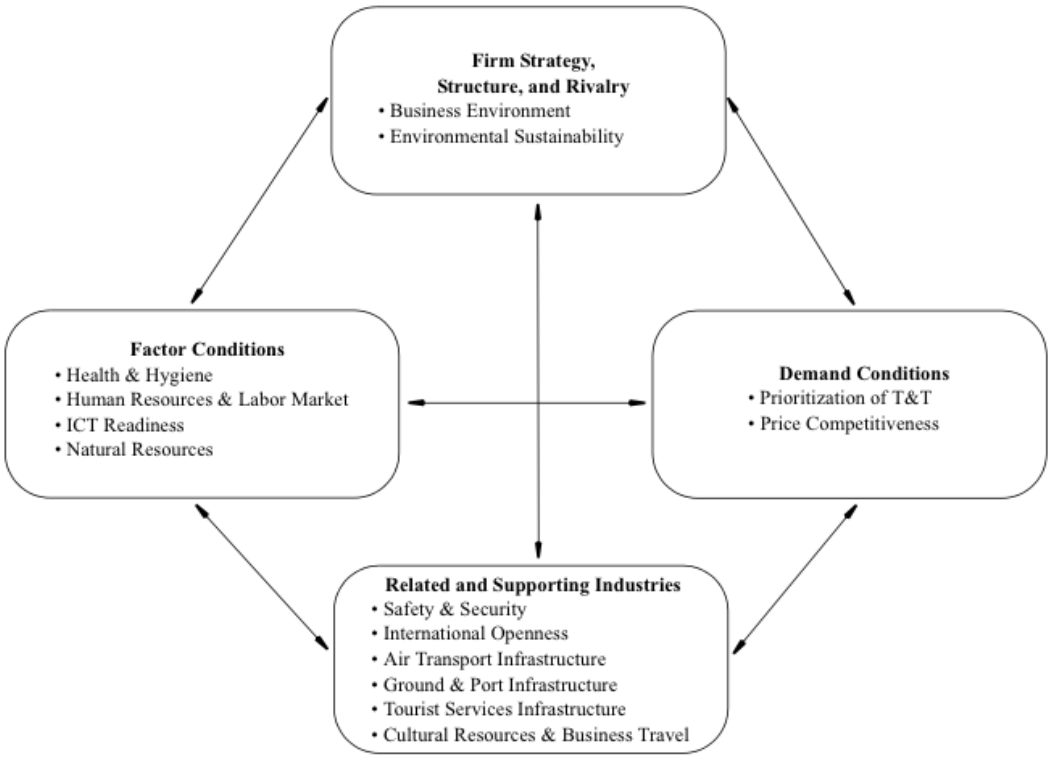


***Figure 2.2*. The 14 factors that comprise the Travel and Tourism Competitiveness Index (TTCI) applied to the dimensions of Porter's (1998) diamond theory reciprocal model.**

***Factor conditions*.** The Factor Conditions dimension refers to conditions that reflect the presence of high quality, specialized inputs that are available to firms. These include human resources, physical resources, knowledge resources, capital resources, and infrastructure (Porter, 1998). For example, with respect to human and capital resources, German companies have been able to steadily improve product performance and quality in optics because of the availability of graduates from special university programs in optics physics and a pool of highly skilled workers trained in specialized apprenticeship programs (Porter, 1998).

Specialized resources are often specific for an industry and important for its competitiveness, and can be created to compensate for factor disadvantages.

In the context of the current study and as shown in Figure 2.2, the TTCI factors that were considered Factor Conditions included Health and Hygiene, Human Resources and Labor Market, Information and Communication Technology (ICT) Readiness, and Natural Resources because these factors are directly linked to economic growth and are important for business development. According to Porter (1998), these TTCI factors qualify as Factor Conditions because they can be clearly identified as human resources, knowledge resources, and infrastructure. Although Porter identifies infrastructure, generally, as a Factor Conditions, Dwyer and Kim (2003) grouped all the components of the Tourist Services Infrastructure, Air Transport Infrastructure, and Ground and Port Infrastructure TTCI factors as Related and Supporting Industries (a dimension of Porter's model that is covered below). Although Porter's categorization makes sense for most industries, these factors directly relate to and support the T&T industry, so Dwyer and Kim's framework was followed in the current study.

Firm strategy, structure, and rivalry. This dimension of Porter's (1998) diamond model refers to the rules and incentives that govern competition. They reflect the way in which companies within a particular industry are created, set goals, and are managed, all of which are important for success. For example, in Italy, many successful international competitors are relatively small or medium-

sized firms that are privately owned and run like extended families, whereas in Germany the top management of many large firms consists of individuals with technical backgrounds and these firms are hierarchical in organization and management practices.

Firms' goals can be reflected in the characteristics of capital markets in the home base and the compensation practices of managers. In Germany and Switzerland, where banks comprise a substantial part of the nation's shareholders, most shares are held for long-term appreciation and are rarely traded. Companies there do well in mature industries, where ongoing investment in R&D and new facilities is essential but returns may only be moderate. In contrast, the United States is at the opposite end of the spectrum with a large pool of risk capital but common trading of public companies and a strong focus by investors on quarterly and annual share-price appreciation. Unlike Germany and Switzerland, the U.S. does well in relatively new industries such as software and biotechnology. However, the presence of intense rivalry in the home base is also important because it creates pressure to innovate in order to upgrade competitiveness.

With respect to the current study and as illustrated in Figure 2.2, two TTCI factors were incorporated within Porter's (1998) Firm Strategy, Structure, and Rivalry dimension: Business Environment and Environmental Sustainability. The former was assigned to this dimension because it describes general operating conditions for firms in terms of legalities, regulations, and taxation, all of which

directly influence a firm's structure and management. The latter was assigned to this dimension because as indicated above a destination environment's resources such as ecological, social, and cultural resources are managed by both public and private firms to maintain future economic viability, attractiveness, appeal, and competitiveness.

Demand conditions. The Demand Conditions dimension of Porter's (1998) diamond model refers to the nature and sophistication of local customer needs. Focusing on local needs—that is, those of the home market—can help companies within an industry create a competitive advantage when sophisticated home market buyers pressure firms to innovate faster and to create more advanced products than those of competitors (Porter, 1998). For example, Japanese consumers who live in small, tightly packed homes, must contend with hot, humid summers and high electrical energy costs—a daunting combination of circumstances. In response, Japanese companies have pioneered compact, quiet air-conditioning units powered by energy-saving rotary compressors. In industry after industry, the tightly constrained requirements of the Japanese market have forced companies to innovate, yielding products that are light, thin, short, small, and internationally accepted.

Within the context of the current study, the TTCI factor of Prioritization of T&T was assigned to the Demand Conditions dimension because government support of and expenditures in a country's T&T industry can serve as a potent

source of domestic demand. For example, in the late 1980s, the significance of holiday-taking by Emiratis and residents outside the United Arab Emirates (UAE) identified and indicated to the government and authorities that tourism was a possible growth industry there. Accordingly, the UAE government intervened and began to spend on tourism with activity being greatest in Dubai and Abu Dhabi. Furthermore, government agencies adopted several tourism programs as core elements of their economic diversification initiatives, encouraging and stimulating domestic demand in tourism. These agencies have invested heavily in expensive facilities, as well as undertaken extensive marketing, and hence, the outcome has been strong growth in the tourism industry (Henderson, 2006).

The TTCI factor of Price Competitiveness was also assigned to the Demand Conditions dimension because the price level of a country substantially reflects the level of domestic demand for the goods and services that comprise the basic necessities of living in that country. Although when considered from a microeconomic perspective, a lower price level (greater price competitiveness) might be associated with a lower demand for those necessities, it could just as easily be the case that a lower price level simply reflects a higher supply for them, and that this abundant supply has intersected the demand curve at a higher quantity demanded and lower price. Porter (1998) characterized his Demand Conditions dimension as reflecting the robustness of the domestic demand for that industry, and the high quantity demanded for these basic necessities in highly price-

competitive tourism destinations can reflect a robust home market for those goods and services in that country.

Related and supporting industries. This dimension of Porter's (1998) diamond model refers to the local availability of supporting industries, which can produce inputs that are important for innovation and internationalization. These industries provide cost-effective inputs, but they also participate in the upgrading process, thus stimulating other companies in the chain to innovate. For example, the tourism industry could support the hotel and airlines industries. As a result, it makes sense to assign the TTCI factors of Air Transport Infrastructure, Ground and Port Infrastructure, and Tourist Services Infrastructure to the Related and Supporting Industries dimension. As illustrated in Figure 2.2, three other TTCI factors also were assigned to this dimension. The Safety and Security factor and the International Openness factor were assigned to this dimension because the police, military, and border control industries in a country have a particularly supportive role for the T&T industry. The Cultural Resources and Business Travel factor was assigned to this dimension because it directly reflected part of Dwyer and Kim's (2003) model.

Deriving the research questions and hypotheses from Porter's (1998) diamond model. As illustrated in Figure 2.1, Porter's (1998) diamond model posits a reciprocal relationship between any two determinants, which is illustrated by bidirectional arrows: "The effect of one point [on the diamond] often depends on

the state of others" (Porter, 1990, p. 86). Therefore, Research Question 1, which addressed this reciprocal nature, was derived directly from the theory, and the corresponding hypotheses (1a–1d) tested this reciprocal nature with respect to the factors of the TTCI for each of the model's dimensions.

Furthermore, when applied to the aviation industry, because international competitiveness is ultimately about productivity (Porter, 1990), a key measure of airline productivity is passenger seat capacity. This implies, then, that the factors of international competitiveness for a country's T&T industry should have a relationship with a measure of productivity (and therefore, competitiveness) in that industry. Thus, Research Question 2, which examined the relationship between the TTCI factors and airline passenger seat capacity, also was derived from Porter's (1998) diamond model, and the corresponding hypothesis posited that this relationship would be positive because greater competitiveness is expected to be associated with higher productivity.

Review of Past Research Studies

An exhaustive search of the published literature revealed there have been no previous published studies that: (a) quantitatively applied Porter's (1998) diamond model to the T&T industry, (b) qualitatively applied Porter's diamond model to more than one country's T&T industry, (c) quantitatively investigated the mutual reinforcement or relationship between the contributing factors to international competitiveness in the T&T industry with respect to Porter's model, or (d) applied

Porter's model to the airline industry with respect to the TTCI factors. Instead, most of the relevant studies have focused on factors that contributed to international competitiveness in the T&T industry in only certain countries (Alhowaish, 2016; Bayramoglu, 2015; Crouch & Ritchie, 1999; Gokovali, 2010; Kibara, Odhiambo, & Njuguna, 2012; Mak, 2008; Sanchez-Canizares & Castillo-Canalejo, 2015; Tugcu, 2014) or their association with financial and macroeconomic measures such as economic growth, employment, and GDP (Brida & Risso, 2010; Crouch & Ritchie, 1999; Dwyer, Forsyth, & Dwyer, 2009; Gokovali, 2010; Kim, 2012; Seetanah, 2011; Sinclair, 1998; Webster & Ivanov, 2014). As a result, this section presents five categories of relevant studies from the published literature that helped inform the current study. These included studies that: (a) performed competitiveness analyses of various industries using Porter's diamond model; (b) sought to identify the contributing factors or determinants of countries' international competitiveness in the T&T industry independent of Porter's model; (c) examined the relationship between countries' competitiveness in the T&T industry and economic indicators; (d) quantitatively examined the relationship among the Travel and Tourism Competitiveness Index's (TTCI) components; and (e) involved an aviation context in which airline seat capacity, as measured by available seat kilometers (ASK), was targeted as a dependent variable.

Competitiveness analyses of various industries using Porter's (1998) diamond model. Vu and Pham (2016) compared the international competitiveness

of Vietnam and China's Garment and Textile (G&T) industries using the Generalized Double Diamond Model (GDDM), which is an extension of Porter's (1998) diamond model that also included an international aspect of each dimension. China was taken as the benchmark country, and 27 hard data indicators for each country were compared with a few indicators representing each dimension, some domestically and others internationally. The design of Vu and Pham's study could be termed "descriptive quantitative," as the hard data were simply compared with percentiles of one country's data to the other. No hypotheses were made and no statistical tests were used.

With respect to Porter's (1998) diamond model, Vu and Pham (2016) reported that China's G&T industry was more competitive than Vietnam's in every dimension internationally as well as on all the dimensions except Factor Conditions domestically. The scores for each dimension were given in radar charts without always indicating the actual values in the text. Domestically, Vietnam's G&T industry got especially weak scores in Demand Conditions and Related and Supporting Industries as compared to China's. Internationally, Vietnam's Factor Conditions and Related and Supporting Industries scores were extremely weak for that industry as compared to China's. An overall conclusion was that Related and Supporting Industries, especially, deserve improvement in Vietnam's G&T industry.

Vu and Pham's (2016) study helped inform the current study by confirming the application of Porter's (1998) original diamond model. Although Vu and Pham created a relatively simple and effective competitiveness index for the G&T industry based on existing literature, the use of the GDDM was deemed inappropriate for the current study because the T&T industry is international by definition. Vu and Pham's study also emphasized the importance of conducting and reporting more than descriptive statistics when working with Porter's model. What their study lacked was a more rigorous statistical analysis of the competitiveness index data that would enable the reader to understand the relationship among the contributing factors that made up Vietnam and China's G&T industries. The current study addressed this weakness by testing a set of hypotheses deduced from Porter's diamond model and applying them to the aviation industry.

Contributing factors to countries' international competitiveness in the T&T industry independent of Porter's (1988) diamond model. Multiple models exist for understanding what factors lead to countries' destination competitiveness in the T&T industry, and a survey of them could not be complete without including the Travel and Tourism Competitive Index (TTCI) itself. The TTCI was described in Chapter 1, but Crouch (2007a) critiqued the first version of the TTCI and identified several serious concerns with it. The first criticism was that the TTCI lacked scientific basis or reference to existing research in its design. The current study did not use the overall TTCI score, however, only the factor scores that were

variously weighted to calculate it, so some of the lack of support for the TTCI's scoring methodology was not relevant here.

Another of Crouch's (2007a) criticisms was the unsuitability or underweighting of certain indicators, including "very limited coverage of variables related to destination policy, planning, development and management (only two of the 58 variables)" and "very limited coverage also of core tourism resources associated with physiography, climate, culture and history (also only two variables)" (p. 77). However, since the 2011 edition of the TTCI, there has been a factor devoted to "prioritization of T&T," which significantly raises the weighting of destination policy, planning, development, and management (WEF, 2011). Although physiography and climate cannot be easily quantified directly, measures of natural, cultural, and historical attractions made up the bulk of the Natural and Cultural Resources factors, which received one quarter of the weighting of the overall TTCI score (WEF, 2017). These increased weightings addressed these concerns.

Other important criticisms made by Crouch (2007a) included questions about survey suitability and reliability due to lack of adjustment for different treatment of Likert scales in different cultures, and for differences in the scaling of hard data versus survey data. Subsequent to the date of Crouch's critique, the Executive Opinion Survey, upon which much of the TTCI was based, has been

audited and refined, and his concerns with regard to cultural differences in Likert scales were addressed:

> … It was decided not to re-weight the data using vignettes because of the limited effectiveness of such a procedure and to prevent introducing additional noise into the data that can occur with such an approach. In view of aiming to prevent national bias, the Partner Institutes are reminded to complete the survey according to guidelines and to ask the respondents to answer the survey in view of the country they are assessing based on international comparison. (Schwab & Sala-i-Martin, 2015, p. 78–79)

On the other hand, the concern about hard data versus survey data scaling has not been addressed: To ensure comparability between the two, the World Economic Forum (WEF) should re-scale the survey data based on the range of scores for each survey question just as it does for hard data (Crouch, 2007a). Overall, even Crouch (2007a) welcomed the introduction of the TTCI, and the implications of his critique for the current study were that, despite the TTCI's shortcomings (many of which were addressed by the WEF), it seems to be the best compilation of T&T competitiveness data available.

In further supporting the current study's grouping of TTCI factors into four variable sets that corresponded to Porter's (1998) four dimensions, other models for understanding the T&T industry's competitiveness in a country also were applied. Studies that developed and applied these models included Crouch (2007b), Dwyer

and Kim (2003), Enright and Newton (2004), Kayar and Kozak (2010), and Ritchie and Crouch (1999, 2000, 2003, 2010). A brief summary of each follows.

Crouch (2007b). In an empirical study using analytic hierarchy process, Crouch created a model of destination competitiveness and found 10 of 36 factors were statistically significant ($p < .05$). These factors included physiography and climate, market ties, culture and history, tourism superstructure, safety and security, cost/value, accessibility, awareness/image, location (proximity to major markets), and infrastructure. Crouch's methodology was a cross-sectional survey and his sampling strategy was purposive. His sample consisted of $N = 83$ people deemed to be knowledgeable about the T&T industry. Crouch provided no further information about the sample and population.

The implications of Crouch's (2007b) study for the current study were that most of the attributes Crouch reported as being statistically significant aligned with those used in the TTCI at least to some extent. His physiography and climate factor, for example, was reflected in indicators comprising the TTCI's natural resources factor: number of World Heritage natural sites, total known species, and total protected areas reflected physiography in particular, although it and climate were only indirectly measured by the other two indicators comprising that factor, natural tourism digital demand and attractiveness of natural assets. The market ties factor, which referred to personal and cultural linkages with other countries that might help generate T&T activity, was partially measured by indicators comprising

the TTCI's cultural resources and business travel factor: number of World Heritage cultural sites, number of oral and intangible cultural expressions, number of sports stadiums, and number of international association meetings. Crouch's culture and history factor corresponded closely to the aforementioned indicators comprising the cultural resources and business travel TTCI factor as well as the final indicator comprising it, cultural and entertainment tourism digital demand. Tourism superstructure was partially measured by the TTCI's tourist services infrastructure factor indicators: hotel rooms, quality of tourism infrastructure, presence of major car rental companies, and automated teller machines per adult population. Crouch's safety and security factor was directly measured by a TTCI factor of the same name. Cost/value was similarly reflected in the TTCI's price competitiveness factor. Crouch's accessibility factor was partially captured by the TTCI's international openness factor as well as its air transport infrastructure and ground and port infrastructure factors. These TTCI factors, as well as aspects of the business environment, health and hygiene, and human resources and labor market TTCI factors, reflected Crouch's infrastructure factor. Awareness/image was reflected within two of the six indicators comprising the TTCI's prioritization of T&T factor: effectiveness of marketing to attract tourists and Country Brand Strategy rating. Only one of Crouch's statistically significant factors was not reflected in the TTCI: location (proximity to major markets).

Further research would be required to substantiate Crouch's (2007b) results due to the nonprobability sampling strategy and scant descriptions of the method. However, the degree of overlap between the aforementioned factors found statistically significant by Crouch and those comprising the TTCI was substantial, as only two factors in the TTCI had no overlap with them: safety and security and Information Communication Technology (ICT) readiness. This degree of overlap added support to the TTCI's methodology of measuring T&T competitiveness.

Ritchie and Crouch (1999, 2000, 2003, 2010). In a series of four qualitative studies over 11 years using what appears to be a grounded theory methodology, Ritchie and Crouch developed a conceptual model that systemically addressed the nature of destination competitiveness and posited factors to explain it for a country. Ritchie and Crouch built this model inductively using focus group discussions and survey interviews that occurred at T&T industry conferences, executive programs on destination management, and conference calls with leaders of convention and visitor bureaus and national tourism organizations. No other information was given on the number of participants sampled, the populations from which the sample was selected, and the sampling strategy used. However, the use of multiple data collection methods (data triangulation) and the long duration (prolonged engagement) to develop this framework increased the credibility of their study.

The model Ritchie and Crouch (1999, 2000, 2003, 2010) developed consisted of seven components: two forces and five dimensions made of numerous

factors. The forces were the global (macro) environment and the competitive (micro) environment, both of which could impact the four dimensions of the T&T system in a country indirectly and directly. The five dimensions were Core Resources and Attractors; Supporting Factors and Resources; Destination Management; Qualifying and Amplifying Determinants; and Destination Policy, Planning, and Development. The factors that made up the global (macro) environment force were the economy, technology, political situation, ecology, sociocultural environment, and demographic trends. The elements of the competitive (micro) environment included customers (travelers and tourists), suppliers, intermediaries and facilitators, competitors, destination culture, and interfacing publics.

The first dimension, Core Resources and Attractors, consisted of six factors: physiography and climate, culture and history, market ties, mix of activities, special events, and superstructure. The Supporting Factors and Resources dimension were made up of five factors including infrastructure, accessibility, facilitating resources, enterprise, and political will. The Destination Management dimension was comprised of nine factors: organization, destination marketing, quality of service or total quality of experience, availability of information, human research development, financial institutions, visitor management, crisis management, and resource stewardship. The Qualifying and Amplifying Determinants dimension consisted of six factors: location, safety and security, cost and value,

interdependencies, awareness and image, and carrying capacity of the destination. The fifth and final dimension, Destination Policy, Planning, and Development, included the system definition of the tourism destination, the destination's philosophy and values, the vision of the destination, positioning and branding, competitive and collaborative analysis, monitoring and evaluation of policies and their outcome, tourism development, and audit of the pre-existing situation.

Ritchie and Crouch (1999, 2000, 2003, 2010) acknowledged that their model lacked determination of the relative importance of its dimensions, factors, and the interplay among these dimensions and factors. They further acknowledged that their studies addressed the relationship between their model of destination competitiveness and the effect of macro environment variables only qualitatively, and called for more rigorous quantitative research to confirm these relationships.

When examined from the perspective of the current study, the qualitative indicators of the accessibility of a destination factor in Ritchie and Crouch's (2003) model strongly resembled those of the air transport infrastructure and international openness factors in the TTCI (World Economic Forum, 2017a). Ritchie and Crouch placed the accessibility of a destination factor under the Supporting Factors and Resources dimension of their model. As a result, I placed the two corresponding TTCI factors, Air Transport Infrastructure and International Openness, under the Related and Supporting Industries dimension of Porter's (1998) model. According to Ritchie and Crouch (2010, p. 1057):

> (A) destination with an abundance of core resources and attractors but a dearth of supporting factors and resources, may find it very difficult to develop its tourism industry, at least in the short term, until some attention is paid to those things that are lacking.

This statement corresponds well with what would be indicated by Porter's model.

Enright and Newton (2004). Enright and Newton conducted survey research and purposively selected a sample of people deemed to be knowledgeable in the T&T industry from Hong Kong. Based on the responses they received, Enright and Newton developed a framework that provided a template for determining the importance of factors in contributing to competitiveness in destination tourism in the Asia Pacific region and a destination's relative competitiveness for each of the factors.

Using these data, Enright and Newton (2004) conducted an Importance Performance Analysis (IPA) that combined both a set of tourism-specific attractors and a set of business-related factors to rank the importance of each factor as well as the destination's relative competitiveness on each factor. The study's instrument had 52 items comprised of 15 tourism attractors and 37 business-related factors. These items were determined based on tourism literature, specifically Crouch and Ritchie's (1999) model and Porter's (1998) diamond model. The tourism attractors included safety, cuisine, dedicated tourism attractions, visual appeal, well-known landmarks, nightlife, different culture, special events, interesting festivals, local

way of life, interesting architecture, climate, notable history, museums and galleries, and music and performances. The business factors included political stability, international access, internal transportation facilities, free port status, government policy, cleanliness of government, communication facilities, good retail sector, staff skills, overall economic condition, access to information, China market potential, local managerial skills, transparency policy making, investment incentives, banking and financial system, geographic location, high quality accommodation, support from related industries, tax regime, long haul market potential, presence of international firms, other Asia Pacific market potential, education and training institutions, regulatory framework, level of technology, good firm cooperation, staff costs, other infrastructure, property related costs, strategies of international firm, other costs, strong currency, strategies of local firms, community institutions, tough local competition, and local market demand.

In the first quarter of 2000, Enright and Newton (2004) surveyed two groups deemed to be knowledgeable about the T&T industry: senior business managers and other practitioners in the T&T industry. The survey yielded 183 responses, which was a 16.4% response rate. Enright and Newton neither reported its duration nor the exact number of participants in each group. For the tourism attractors and the business-related factors, respondents were first asked to assess the importance of each factor in contributing to competitiveness in urban tourism in the Asia-Pacific region on a 5-point Likert scale, with 1 being “very important” and

5 being “very unimportant.” In the second stage, respondents were asked to compare Hong Kong with relevant competitor countries and assess its relative competitiveness for each of the factors on a 5-point Likert scale with 1 being “much worse” and 5 being “much better.” Enright and Newton reported a Cronbach alpha of .94 and a construct validity coefficient of .94.

The mean scores for the importance of tourism factors ranged from M = 3.29 to M = 4.64, and the mean scores for the business-related factors ranged from M = 3.60 to M = 4.66. The five most important attractors were safety, cuisine, dedicated tourism attractors, visual appeal, and well-known landmarks with mean scores of M = 4.64, 4.36, 4.33, 4.20, and 4.12, respectively. The two least important factors were museums and galleries (M = 3.42) and music and performances (M = 3.29). The five most important business-related factors were political stability, international access, internal transportation facilities, free port status, and government policy, with mean scores of M = 4.66, 4.54, 4.44, 4.44, and 4.42, respectively. The five least important factors were strong currency, strategies of local firms, community institutions, tough local competition, and local market demand, with mean scores of M = 3.78, 3.73, 3.73, 3.66, and 3.60, respectively.

The mean scores for Hong Kong’s relative performance in the tourism attractors ranged from M = 2.69 for museums and galleries to M = 4.34 for cuisine, and the mean scores for Hong Kong’s relative performance in the business-related factors ranged from a M = 2.31 for staff costs to M = 4.18 for China market

potential. Consistent with the earlier results, the spread between the lowest and highest ranked factors was substantial. According to the results, Hong Kong's main strengths were in cuisine, safety, nightlife, visual appeal, and climate, with mean scores of $M = 4.34$, 4.04, 3.82, 3.73, and 3.46, respectively. Its greatest weaknesses were in museums and galleries, music and performances, and notable history.

Although the relative performance of Hong Kong as a tourist destination had little bearing on the current study, Enright and Newton's (2004) study nevertheless helped inform the current study. For example, all of the tourism attractors found to be most important—safety, cuisine, dedicated tourism attractors, visual appeal, and well-known landmarks—fall under the Safety and Security and Cultural Resources and Business Travel TTCI factors, which were assigned to the Related and Supporting Industries dimension of Porter's (1998) diamond model. On the other hand, all but one of the business-related factors found to be most important, political stability, international access, internal transportation facilities, and free port status, also fall under that same dimension—corresponding to the Safety and Security, International Openness, and Air, Ground and Port Infrastructure TTCI factors, respectively. The last of the most important business-related factors, government policy, was placed under the Prioritization of T&T factor within the Demand Conditions dimension. Therefore, Enright and Newton's (2004) study implied that the Related and Supporting Industries dimension would be expected to have the greatest importance.

Kayar and Kozak (2010). Kayar and Kozak conducted a quantitative study that examined the competitive positions of 28 European countries in the T&T industry using the countries' ranks on the 13 factors based on archived data from the Travel and Tourism Competitiveness Report (World Economic Forum, 2007). Kayar and Kozak used a purposive sampling strategy to select the cases. The rationale for using this strategy was not explicitly discussed except that one could infer that they wanted to only focus on Europe. Kayar and Kozak first used a cluster analysis to divide the sample of 28 countries into three relatively homogeneous groups based on their T&T competitiveness scores on the 13 factors (indexed or standardized to each other based on the varying ranges of scores). The first cluster had eight countries: Bulgaria, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia, and Turkey; the second contained nine countries: Austria, Germany, UK, Denmark, France, Finland, Sweden, Netherlands, and Belgium; and the third cluster had 11 countries: Czech Republic, Estonia, Ireland, Malta, Slovenia, Luxemburg, Spain, Cyprus, Portugal, Greece, and Italy. Kayar and Kozak also calculated the mean scores of the 13 factors for each cluster, indicating that each cluster had a different set of factors in which it scored highly.

Kayar and Kozak (2010) used multidimensional scaling to determine the most effective factors contributing to the T&T competitiveness of those countries. The factors that most contributed to T&T competitiveness for the second cluster were health and hygiene, natural and cultural resources, ground transport

infrastructure, environmental regulation, safety and security, human resources, policy rules and regulations, Information Communications Technology (ICT) infrastructure, and air transport infrastructure with mean cluster scores of M = 6.2, 6.12, 6.01, 5.81, 5.68, 5.65, 5.41, 5.27, and 4.82, respectively. On other hand, the factors that most contributed to the T&T competitiveness of the countries in third cluster were slightly different and included health and hygiene, tourism infrastructure, human resources, national tourism perceptions, safety and security, and natural and cultural resources with means of M = 5.90, 5.69, 5.40, 5.36, 5.26, and 5.10, respectively. The factors that most contributed to the first cluster's T&T competitiveness were human resources, health and hygiene, natural and cultural resources, national tourism perceptions, and price competitiveness with mean scores of M = 5.26, 5.06, 4.92, 4.59, and 4.38, respectively. Based on the multidimensional scaling analysis, Kayar and Kozak found that air transport infrastructure, natural and cultural resources, ground transport infrastructure, human resources, and health and hygiene had the highest impact on destination competitiveness for the entire sample, and each of these factors had a similar level of impact. Countries in the second cluster were the leading countries in terms of these factors.

Another set of factors with a moderate impact on destination competitiveness included environmental regulation, ICT infrastructure, safety and security, human resources, and policy rules and regulations. These factors most

contributed to the competitiveness position for the countries in the third cluster. The final group that had the least impact on T&T competitiveness contained the following factors: tourism infrastructure, prioritization of T&T, national tourism perception, price competitiveness, and human resources. These factors contributed most to the T&T competitiveness scores of the first cluster, even though they were not as significant as the other factors. Note that Kayar and Kozak reported that price competitiveness was the factor that had the lowest impact on the scores.

Kayar and Kozak's (2010) study helped inform the current study by ranking the importance for T&T industry competitiveness of a slightly different list of factors from those that were examined in the current study. Kayar and Kozack's most important factors—air transport infrastructure, natural and cultural resources, ground transport infrastructure, human resources, and health and hygiene—corresponded equally to Porter's (1998) Factor Conditions dimension and Related and Supporting Industries dimension. Therefore, Kayar and Kozack's (2010) findings implied that these dimensions might be found to be most important in the current study as well.

Dwyer and Kim (2003). Dwyer and Kim conducted qualitative research to develop a model of a country's competitiveness in the tourism industry. This model was a comprehensive framework that consisted of dimensions and factors comprised from numerous indicators that were both objective and subjective in nature. Dwyer and Kim developed their framework using information they received

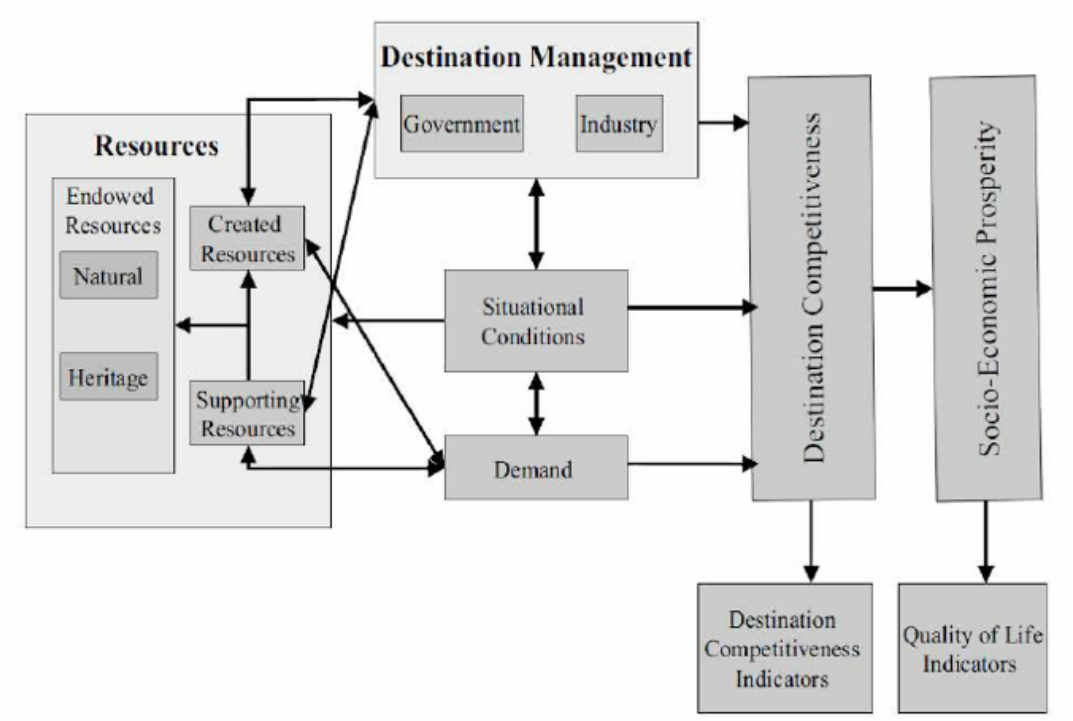


***Figure 2.3*. Dwyer and Kim's (2003) destination competitiveness model.**

from the literature as well as from discussions at workshops that were held in Korea and Australia. Dwyer and Kim did not report when or with whom these discussions took place. As illustrated in Figure 2.3, Dwyer and Kim's results yielded a model that contained four main categories: resources, destination management, situational conditions, and demand. Similar to Porter's (1998) Diamond model, these categories all reciprocally affected and interacted with each other, although the resources category only indirectly affected destination competitiveness through the other three. The resources category also consisted of endowed resources (made up of natural and heritage resources), created resources,

and supporting resources. The destination management category included contributions from government and industry.

With respect to the current study, Dwyer and Kim's (2003) model strongly resembles Porter's (1998) diamond model if it were to be applied to the tourism industry, and it strongly influenced the way I grouped the TTCI factors relative to Porter's dimensions. For example, Dwyer and Kim's Resources corresponds to Porter's Factor Conditions dimension, although some supporting resources are grouped as Supporting and Related Industries in Porter's model. Dwyer and Kim's Demand corresponds to Porter's Demand Conditions dimension, whereas the industry portion of Dwyer and Kim's Destination Management corresponds to Porter's Firm Strategy, Structure, and Rivalry dimension. (*Note*: The government portion falls outside Porter's dimensions but is identified as an auxiliary factor in Porter's model.) Finally, Dwyer and Kim's Situational Conditions, which included economic, environmental, political, legal, and regulatory trends and events, among others, overlaps significantly with Porter's Firm Strategy, Structure, and Rivalry dimension. The descriptions of these aspects of Dwyer and Kim's model, therefore, contributed considerably to informing how the TTCI factors were grouped.

An implication of Dwyer and Kim's (2003) study is that more research needs to be undertaken on the relative importance of the different dimensions of T&T competitiveness. For example, how important are natural resources compared to destination image, and how important is service quality compared to price

competitiveness? The current study helped shed light on these questions given that indicators that constituted the TTCI's factors measured the attributes that are involved. For example, "effectiveness of marketing and branding to attract tourists" and "country brand strategy rating" are indicators within the Prioritization of T&T factor, whereas "degree of customer orientation" is an indicator within the Human Resources and Labor Market factor. Natural Resources and Price Competitiveness also are TTCI factors, and all of these TTCI factors fall within different dimensions of Porter's (1998) model.

Croes and Kubickova (2013). Croes and Kubickova developed a Tourism Competitiveness Index (TCI) based on a sample of seven countries from the Central American region in what appeared to be a correlational study. Unlike other studies, Croes and Kubickova based this index on three indicators: tourism receipts growth rates (to show the trend performance of the destination), real tourism receipts per capita (to show "productivity" of the tourism sector), and tourism's share of GDP (to show tourism value added, another measure of "productivity"). These factors were treated as independent variables, and the dependent variables were the United Nations Development Programme's Human Development Index (HDI; UNDP, n.d.) and real GDP per capita as measures of "quality of life." Croes and Kubickova used a purposive sampling strategy to focus on Central American countries. Croes and Kubickova targeted the Central American region because the region has been focusing on attracting tourism but its efforts largely have been

unevenly successful. One reason cited for this is due to the region's economies, which are in need of growth due to the decline of other sectors.

Croes and Kubickova (2013) implemented their study in three stages. They first conducted a preliminary analysis of the competitiveness of tourism in the region and in each country by calculating the Herfindahl-Hirschman Index (HHI) for each. They then determined the weights of the IVs constituting the TCI by indexing the IVs and calculating corresponding Pearson correlation coefficients of each of the indexed variables to the dependent variables. The presumption was that the IVs with higher correlation to the DVs were more heavily weighted in the TCI, although this was not explained. In the final stage, Croes and Kubickova calculated the TCI for each country as a weighted average of the three IVs using the previously determined weights. Pearson correlation coefficients between the IVs and DVs were then used to determine statistical significance. Croes and Kubickova reported that growth rate of tourism receipts was not statistically significant with either HDI ($p = .1349$) or GDP per capita ($p = .2364$), but the other two IVs were "extremely significant" with both HDI and GDP per capita ($p = .001$). Based on these results, Croes and Kubickova presented the following ranking of tourism competitiveness of Central American countries: Belize, Panama, Costa Rica, El Salvador, Honduras, Nicaragua, and Guatemala.

Croes and Kubickova's (2013) study began with an insightful critique of the existing literature and posited the propositions that (a) when modeling tourism

competitiveness, outputs should be measured instead of inputs, because "similar inputs should provide similar outcome expectations" (p. 149), and (b) a simpler framework is needed. Importantly, also, the idea that quality of life should play a prominent role in measuring destination competitiveness was presented. However, in practice, the framework reduces to a circular argument: the already successful countries are more competitive, in which case little insight is provided beyond basic economic statistics. Destination managers need assistance as to how they can actually improve their destinations' competitiveness, productivity, or success, not to be told which destinations have already achieved these goals.

As a result, Croes and Kubickova' (2013) study informed the current study by showing that TCI does not serve as a model of what explains competitiveness. Although causation is another level of finding, and an elusive one, the value of competitiveness analysis lies in breaking down results into explanatory factors in order to know where to intervene in actual practice. Also, Croes and Kubickova's use of correlations to both weight the variables and test for statistical significance was suspect. Neither of these approaches were used in the current study.

Relationship between countries' international competitiveness in the T&T industry and economic indicators. Studies in this category tended to be quantitative in nature, in contrast to many of the studies in other categories, and included Gokovali (2010), Seetanah (2011), and Webster and Ivanov (2014).

Gokovali (2010). Examining the contribution of the T&T industry to economic activity, Gokovali used a predictive design and sampled only the country of Turkey with multiple measures. Gokovali developed an elasticity model of GNP using the conventional ordinary least squares method that factored in labor, capital investments, and tourism revenues, and the model had an R^2 value of .892. Gokovali conducted his study over a 20-year period, and examined archived data from Turkish governmental sources and the World Bank dating from 1985–2005.

Gokovali (2010) reported that the elasticity of GNP with respect to capital was .46 (p = .068), which was statistically significant at an alpha level of α = .07, while the elasticity of GNP with respect to tourism revenue was .53 (p = .000). "This means that a one percentage increase in capital and tourism revenue increases GNP by 0.47 and 0.53 percentage point, respectively" (p. 148). Gokovali also reported that labor was not a significant contributor. Based on his results, one implication of Gokovali's study is that tourism revenue was the strongest contributor to GNP in Turkey, even stronger than capital investments. This result provided context for the current study by highlighting the importance of the T&T industry to overall economic wellbeing, at least to one country.

Seetanah (2011). In a similar but more complex econometric study, Seetanah used a mixed methods design with predictive and ex post facto aspects and sampled 19 island economies, 19 developing economies, and 11 developed economies between 1990–2007. The use of multiple countries and multiple groups

in the sample over a similarly long duration greatly increased the study's credibility compared to Gokovali (2010), and both had similar dependent variables (GNP and per capita GDP). However, Seetanah discussed neither the rationale for using a purposive sampling strategy nor the rationale for the grouping strategy, which often appeared confusing. For example, Seetanah placed Belize and Guyana in the group of island economies even though both are not islands, and he placed Luxembourg in the group of developing economies even though it has the highest per capita GDP in the world.

Seetanah (2011) modeled per capita GDP with respect to measures of investment in physical capital, investment in human capital, openness of the economy, economic freedom, and the independent variable of interest, namely, tourism development. With the exception of the economic freedom data, which were acquired from the Heritage Foundation's Index of Economic Freedom, Seetanah's primary data source was archival data from the World Bank.

Using the generalized method of moments, Seetanah reported the elasticity of per capita GDP with respect to tourism development for island economies was .12 and .14, respectively, for two different alternative measures of that variable. These elasticity measures contrasted with .06 and .033 with respect to the two measures for developing economies, and .064 and .08, respectively, for developed economies. Seetanah did not report any specific *p* values, but he indicated that these elasticity measures were statistically significant with respect to a 90%

confidence level. Seetanah interpreted these results to mean that "tourism has been an important factor in explaining economic performance in island economies (but) contribution of tourism to economic development of island economies is relative(ly) lower as compared to the classical ingredients of growth" (p. 299).

When compared to Gokovali's (2010) study of Turkey, Seetanah (2011) found that tourism was the second least significant factor in terms of elasticity whereas Gokovali reported that tourism revenue was the most significant factor in terms of elasticity and had a much higher value. It is notable there was no evidence given by Seetanah that the differences in contribution to per capita GDP of tourism development between the groups were statistically significant. Attempting to establish causality, Seetanah applied Granger tests, which showed complex multidirectional and reverse causal relationships between the variables, including tourism development. Leaving aside any conclusions about causality, which seem unwarranted, Seetanah's study provided context for the current study by emphasizing the importance of the T&T industry to economic growth in a sample of island countries.

Webster and Ivanov (2014). Webster and Ivanov conducted a correlational study that examined the impact of the same independent variable as the current study, namely, a country's destination competitiveness as measured by the TTCI on tourism's contribution to real per capita economic growth in that country. Webster and Ivanov's dependent variable was "how many percentage points of the real per

capita economic growth in the country is attributable to tourism" (p. 138), which was calculated using the growth decomposition methodology. The reader will note that Webster and Ivanov's IV and DV are the reverse of the IV and DV used in both Gokovali's (2010) and Seetanah's (2011) respective studies presented earlier. Webster and Ivanov implemented their study between 2000 and 2010, and sampled 131 countries, which represented the entire accessible population of the world's countries that had data for those years (with new TTCI data coming out every 2 years). Webster and Ivanov used annual average values for the variables over the targeted years for each country in order to smooth out short-term fluctuations due to exogenous events. They also used control variables to account for potential confounding factors such as population size, economy size, economic wealth of the local population, tourism GDP, and tourism's share of the country's GDP.

Webster and Ivanov (2014) reported a significant correlation of $r = -.224$ ($p = .01$) between a country's TTCI score and the dependent variable, which implies that tourism's contribution to real per capita economic growth in a country decreased as its T&T industry competitiveness increased. Webster and Ivanov also reported that the result of a multivariable regression analysis yielded a similar correlation coefficient of $r = -.212$ for the independent variable, the TTCI score, but this was not statistically significant ($p = .304$).

With respect to the current study, Webster and Ivanov's (2014) results suggest caution is warranted when hypothesizing a statistically significant positive

relationship between T&T competitiveness and economic growth. However, the current study examined a different dependent variable, airline activity, which is much narrower and presumably more closely associated with T&T competitiveness than economic growth. More importantly, though, the current study did not use the overall TTCI score, but instead. a regrouping of its constituent factors with a methodology grounded in Porter's (1998) diamond model.

Quantitative relationship among the TTCI's components. Cirstea (2014) conducted a correlational study that examined the relationship between the TTCI overall score and its subindexes as well as the underlying factors contributing to T&T competitiveness. He purposively sampled the top-ranking 15 countries in the World Economic Forum's 2011 Global Competitiveness Report. These countries were Switzerland, Singapore, Sweden, Finland, USA, Germany, Netherlands, Denmark, Japan, United Kingdom, Hong Kong, Canada, Taiwan, Qatar, Belgium. Cirstea used 2011 TTCI data to examine the relationship between the overall TTCI score and the scores on the three subindexes that constituted that year's TTCI: Legal Framework (LF), Business Environment and Infrastructure (BEI), and Human, Cultural and Natural Resources (HCNR). Cirstea also examined the relationship between the overall TTCI score and the score on each factor of the 14 factors that comprised the TTCI.

Cirstea (2014) reported that the overall TTCI score was correlated strongly with both HCNR and BEI subindexes, and moderately with LF. These relationships

had Pearson correlation coefficients of r = .91, .88, and .65, respectively. Cirstea also reported that the overall TTCI was strongly correlated with the safety and security factor of LF subindex with r = .90, and moderately with policy rules and regulation, environmental sustainability, health and hygiene, and prioritization of T&T factors (no r values given). These results suggest that safety and security had the most contribution to the LF subindex competitiveness. Cirstea also indicated that the overall TTCI score was correlated strongly with both tourism infrastructure and air transport infrastructure factors with correlation coefficients of r = .73 and.70, respectively. The ICT Infrastructure factor had a moderate relationship with the overall TTCI with a correlation coefficient of r = .55, and the Ground Transport Infrastructure and Price Competitiveness factors had a weak correlation with the overall TTCI, with r = .28 and – .03, respectively. These results suggest that both tourism and air transport infrastructure factors made the most contribution to their respective subindex's competitiveness score. In terms of the factors within the final category, HCNR, Cirstea reported that both natural resources and cultural resources were strongly associated with the TTCI, r = .87 and .86, respectively, and that the overall T&T competitiveness score was moderately associated with human resources, r = .26. The final factor, affinity for T&T, had r = .03, indicating almost no association with the overall TTCI.

Although the current study examined neither overall TTCI scores nor subindexes, it did incorporate the factors that constituted them. Cirstea's (2014)

results shed light on which factors contributed most to T&T competitiveness, at least within the model implicit in the TTCI. These results may not be generalizable to the population (the countries of the world) due to the small purposive sample of only highly developed, internationally competitive countries. If the results were to be generalized, however, an argument could be made that the factors with little to no correlation with overall T&T competitiveness could be left out of the analysis. In any case, as reported in Chapter 5, the current study's results were similar to Cirstea's findings, providing stronger evidence for the targeted relationships.

Aviation studies involving airline seat capacity measured in terms of available seat kilometers (ASK). Two studies that helped inform the current study with respect to using ASK as a measure of airline seat capacity were Yu Chang, and Chen (2014) and Turcu and Turturea (2015).

Yu, Chang, and Chen (2016). Yu et al. performed a descriptive econometric case study of 13 low-cost carrier (LCC) airlines operating in U.S. and European markets in 2010, by examining their capacity utilization and cost structures. Yu et al. obtained data from 2010 company annual reports via a convenience sampling strategy, which stemmed from those airlines that provided the targeted data in their annual reports. The seat capacity of the sampled airlines ranged from 9.17 billion to 157.512 billion ASK. No specific research questions were given other than an implied purpose to calculate various econometric figures

for the airlines. Because it was a case study, no hypotheses were posited and no statistical tests were performed.

Yu et al. (2016) reported that the majority of the sample's LCCs had room to more optimally make use of their capacity, and all could have improved market efficiency and reduced costs. More specifically, three of the LCCs needed to enhance technical efficiency, and four needed to optimize their mix of variable inputs. Limitations of Yu et al.'s study included the convenience sampling strategy and the use of data from only one year, limiting its generalizability. Another limitation is that environmental factors were not included in the analysis. On the other hand, the comprehensive review of previous literature and the rigorous econometric analysis increased the study's credibility.

When applied to the context of the current study (Part B), Yu et al.'s (2016) findings confirmed that ASK is a measure of output, or capacity, for airlines. Yu et al. calculated capacity utilization by determining the minimum level of fixed costs that could have been used to produce the level of ASK that each airline outputted and compared it to the actual level of fixed costs incurred. They reported that lower fixed costs for a given level of ASK indicated higher capacity utilization, which infers higher productivity. Thus, findings from Yu et al. provided support for the current study's second hypothesis that the relationship between seat capacity and the TTCI factors would be positive because greater competitiveness is expected to be associated with higher productivity.

Turcu and Turturea (2015). Turcu and Turturea examined the relationship between changes in financial and non-financial indicators (IVs) and changes in the stock prices (DV) of 32 airlines from 19 different countries using data from 2006 to 2013. The financial indicators examined were changes in pretax return on assets, current ratio, debt-to-equity ratio, and sales growth; the non-financial indicators were changes in load factor and ASK. The selected sample initially consisted of 47 airlines but was reduced to 32 because of data limitations in the data source, which was the Thomson Reuters Eikon Database. Research questions were not specifically listed but were implied by the stated purpose of examining the relationship between the variables.

Using a multiple regression analysis strategy, Turcu and Turturea (2015) reported that all the variables except change in debt-to-equity ratio and sales growth had a statistically significant relationship, $F = 9.21$, $p < .05$, with change in stock price, and that the model explained 26.28% of the variability in stock price. The change in pretax return on assets had the highest correlation with the DV, at 42.97%, followed by change in load factor at 30.39%, and change in current ratio at 28.89%. Change in ASK had the lowest correlation at 12.51% and was significant at an alpha level of $\alpha = .10$, but not at the preset $\alpha = .05$. Aspects of Turcu and Turturea's study that added to its credibility included the use of data from several years and the illustration of the complete results of the multiple regression analyses

through the use of multiple tables. Drawbacks included a lack of a priori and post hoc power analyses and the use of variable names that lacked context.

With respect to Part B of the current study, a key issue I had to address was how to measure airlines' performance. One possibility was to examine airlines' stock performance, which Turcu and Turturea's (2015) used as their dependent variable. Other considerations included various financial and non-financial indicators, which Turcu and Turturea's (2015) used as independent variables. However, after reviewing Turcu and Turturea, I recognized that ASK would be the easiest and most logical measure to compare airline performance and countries. Furthermore, Turcu and Turturea's (2015) finding that increases in ASK have a positive relationship with airline stock price performance supports the current study's use of ASK to measure countries' airline performance. Another implication for the current study was Turcu and Turturea's (2015) use of non-financial indicators to measure the productivity of an airline, which also supported the current study's use of ASK.

Summary and Study Implications

Porter's (1998) theoretical diamond model can be applied effectively to diverse industries but needed to be more systemically, rigorously, and comprehensively examined in the T&T industry. Much qualitative investigation into the contributing factors to international competitiveness in the T&T industry produced a few models similar to Porter's that have considerable consensus among

themselves. The existing literature on the indicators and contributors to competitiveness in the T&T industry supported the use of TTCI data, and most of its constituent factors had a strong relationship with overall T&T competitiveness as measured by the TTCI's model. There also was support for the idea that tourism can contribute to economic growth, especially in island economies, though T&T competitiveness, as opposed to tourism investment, did not seem to have a positive relationship with tourism's contribution to economic growth.

The degree of consensus and overlap between the models of T&T industry competitiveness provided confidence to the TTCI factor groupings used in the current study. The TTCI's data could thus be adapted to model T&T industry competitiveness more closely to this consensus theory than the TTCI's implicit model. Furthermore, the degree of interaction between the TTCI's factors, and between dimensions of the model such as Porter's (1998), warranted exploration. Beyond investigating contributions to economic growth, there also was a need to understand more clearly how benefits to any country's airline industry might be associated with a more competitive T&T industry in that country. This issue had not yet been investigated. Furthermore, using airline seat capacity (determined by ASK) to measure the relationship between national T&T industry competitiveness and airline capacity was supported by the literature, and the current study served as an initial exploration of this question and paved the way for future research on it.

Chapter 3

Methodology

Population and Sample

Population. The target population of the proposed study was all the countries in the world, which, according to the total countries recognized by the U.S. State Department, was $N = 195$. These countries ranged from nearly 1,000 to 1.37 billion in population, from 10 to 17,098,242 square miles in land size, from $1.5 million to $21.3 trillion in GDP, and from $400 to $139,100 in per capita GDP (U.S. Central Intelligence Agency, 2017).

The accessible population was the $N = 136$ countries that had Travel and Tourism Competitiveness Index (TTCI) scores for the year 2017. These countries represented 70% of the countries in the world and encompassed 98% of world GDP (World Economic Forum, 2017b, p. 8). They also ranged from 89,000 to 1.36 billion in population, from 123.6 to 6.6 million square miles in land size, and from $748 to $100,532 in per capita annual GDP (World Economic Forum, 2017a).

Sample. The sample consisted of all $N = 136$ countries that comprised the accessible population. Thus, in this sense the sample represented a census relative to the accessible population, and the sampling strategy was convenience because the data were conveniently available for the targeted countries. As presented in Table 1.1 (Chapter 1), the TTCI partitioned these countries into five major regions: Europe and Eurasia ($N = 46$), The Americas ($N = 23$), Middle East and North Africa ($N =$

15), Sub-Saharan Africa ($N = 30$), and Asia and the Pacific ($N = 22$). Table 1.1 also contains a list of the countries and the regions in which they are located, and the reader is directed to Table 1.1 in Chapter 1 for more information.

Power analysis. As reported in Table 3.1, post hoc power analyses for the six unique reciprocal relationships relative to Porter's (1998) diamond model yielded power values greater than .99. The reader is reminded that more detailed analyses of these relationships are provided in Chapter 4. For the present, though, only the more global reciprocal relationships are provided. The reader will also note for the second part of the study, which involved a simultaneous regression analysis in which the 14 TTCI factors were regressed on airline seat capacity, the corresponding power also was greater than .99.

Instrumentation

The current study did not use any type of formal data collection instrument. Instead, data were acquired from the following publicly accessible web sites:

TTCI data. The Travel and Tourism Competitiveness Index data were acquired from the 2017 edition of the Travel and Tourism Competitiveness Report (World Economic Forum, 2017). This report is published biennially and benchmarks the T&T competitiveness of 136 economies. The 14 factors that comprised the TTCI (see Chapter 1, Figure 1.2) are calculated on a scale from 1 to 7, with 7 being the most competitive. Ninety indicators are used to calculate the 14 factors, and each factor represents an average of a non-overlapping subset of these

Table 3.1

Summary of Post Hoc Power Analyses

Porter's (1998) Dimensions (Sets of IVs)	Λ^b	*ES*	Power
Part A: Examining the Relationship of the TTCI Factors to Porter's (1998) Model			
Reciprocal relationship between:[a]			
• Factor Conditions and Firm Strategy, Structure, & Rivalry	.83	0.20	> .99
• Factor Conditions and Demand Conditions	.71	0.41	> .99
• Factor Conditions and Related & Supporting Industries	.24	3.12	> .99
• Firm Strategy, Structure, & Rivalry and Demand Conditions	.57	0.75	> .99
• Firm Strategy, Structure, & Rivalry and Related & Supporting Industries	.28	2.57	> .99
• Demand Conditions and Related & Supporting Industries	.46	1.17	> .99
Part B: Examining the Relationship of the TTCI Factors to PCAAWASK			
All 14 TTCI Factors (R^2 = .87)	.13	6.7	> .99

Note. N = 136.

[a]Factor Conditions (Set A) consisted of Health and Hygiene and Natural Resources. Firm Strategy, Structure, and Rivalry (Set B) consisted of Business Environment and Environmental Sustainability. Demand Conditions (Set C) consisted of Prioritization of T&T and Price Competitiveness. Related and Supporting Industries (Set D) consisted of Safety & Security, International Openness, Air Transport Infrastructure, Ground & Port Infrastructure, and Cultural Resources & Business Travel. The six reciprocal relationships reflect the unique relationships without duplication. [b]Λ = Wilks' Lambda is a multivariate measure that represents the proportion of variance in the DVs that is not accounted for by the IVs. In this context, $\Lambda = 1 - R^2$.

90 indicators. For example, under the Infrastructure heading, key indicators for the Air Transport Infrastructure factor include: (a) quality of air transport infrastructure; (b) available seat kilometers, domestic; (c) available seat kilometers, international; (d) aircraft departures per 1,000 population; (e) airport density based on number of airports per million population; and (f) number of operating airlines. Of these 90 indicators, 31 are from questionnaires collected by various partner institutes of the Executive Opinion Survey (EOS). The most recent EOS consisted of 13,340 respondents from 136 economies. The remaining 59 indicators are acquired from

several international organizations such as the World Bank, National Consortium for the Study of Terrorism and Responses to Terrorism, United Nations, World Travel & Tourism Council, World Tourism Organization, World Health Organization, and UNESCO (World Economic Forum, 2017a). A description of the 14 TTCI factors is provided in Table 3.2, which is presented in the chapter in the Data Analysis section.

Airline passenger capacity. To obtain the per capita annual average of weekly available seat kilometers (PCAAWASKs) data, I accessed a database that contained the annual average of weekly available seat kilometers (AAWASKs) for each targeted country from 2015, added the domestic and international figures, and then divided by each country's respective population. All countries in the accessible population had quantifiable measures associated with both TTCI scores and PCAAWASKs figures, so was no missing data points. Furthermore, the sum of domestic and international AAWASK data was used to calculate PCAAWASK data to avoid a possible confounding situation. If these data were analyzed separately, land size or population size would then become a confounding factor because larger countries tend to have a higher proportion of domestic flights, and neither the domestic nor the international PCAAWASK figures would be comparable between countries of differing size. The AAWASK data were reported by IATA (2015) and converted to PCAAWASKs by dividing by each country's population as reported by the World Bank (2015). As noted in the above example involving the Air Transport Infrastructure factor, it is relevant to the current study that the TTCI has domestic

and international AAWASKs as component indicators of its Air Transport Infrastructure factor whereas the current study measured PCAAWASKs. In this sense, there was a small degree of overlap between components partially comprising an independent variable—two indicators out of six within the Air Transport Infrastructure factor—and the dependent variables, but it was presumed that the per-capita adjustment of the PCAAWASKs mitigated this overlap.

Validity and reliability issues. The use of archival data for the current study has both advantages and disadvantages. With respect to the former, the data sources were available to me instantly at no cost, contained data on a substantial portion of countries, and were produced by well-known international organizations. There are several disadvantages to using such data, however, particularly with respect to instrumentation validity and reliability. Because I did not know how the data were acquired and stored, I am unable to assess or give attention to the corresponding validity and reliability related to any inferences, conclusions, or recommendations that result from data analysis. This disadvantage is mitigated, though, because of the presumed integrity of the data based on its usage: Various organizations and governments around the world use these data to make policy decisions.

Procedures

Research methodology. The research methodology that best fit the current study was an associational methodology, specifically, an explanatory correlational design. This design was appropriate because the study involved examining

relationships among multiple factors associated with a single group, namely, the countries of the world, and involved no manipulation. The current study examined relationships among the targeted factors. According to Ary, Jacobs, and Sorenson (2010), an explanatory study helps identify relationships among variables, which then can be used to help clarify an understanding of the phenomenon. In the context of the current study, I examined the mutual interactions among the 14 contributing factors to international competitiveness in the T&T industry relative to Porter's (1998) diamond model of international competitiveness. I also examined the relationship between the 14 TTCI factors and airline passenger capacity measured by the per capita annual average of weekly available seat kilometers.

Human subject research. As noted earlier, the current study involved collecting and analyzing archival data stored in publicly accessible databases. Furthermore, the targeted data involved characteristics of countries and airlines and included factors such as landmass, GDP, population size, and airline seat capacity. As such, the data neither were collected from human participants nor involved data provided from human participants. As a result, the proposed study's use of de-identified, publicly available data did not constitute human subjects research as defined at 45 CFR 46.102, and hence no application to FIT's IRB was warranted.

Study implementation. The current study was implemented during the Spring 2018 semester. During this time, I acquired TTCI data from the 2017 edition of the Travel and Tourism Competitiveness Report (World Economic Forum,

2017a) and organized the data into functional sets as presented In Table 3.2. I also accessed a database of AAWASKs for each country, added the domestic and international figures, and divided by the country's population as described above to generate corresponding PCAAWASKs data. Once I acquired all the data, I then began data analysis.

Threats to internal validity. Internal validity refers to the extent to which changes in an outcome variable (a DV) are related directly and attributed to the treatment administered (an IV). The concept of internal validity is critical because it provides an alternative explanation for the outcome of a study independent of treatment.

Ary et al. (2010) identified 12 threats—or alternative explanations—to internal validity. If these threats are not controlled or mitigated, there could be plausible explanations for the results of the study other than the relationship between the IVs and DV. In this section, I define each of these threats, discuss if they had any impact on the study, and describe how I controlled for or mitigated the effect of those threats that were determined to be relevant to the current study.

History. A history threat refers to any unanticipated event that is not related to the study, but occurs during the study, and could affect the observed outcome. Examples include major political, economic, and cultural events or some minor disruptive factors that occur during a study (Ary et al., 2010). In the context of the current study, the data I used most likely were impacted by many such events, and

thus there is the possibility of a history threat. For example, in early 2017, in the worst diplomatic crisis that hit the Gulf Arab states in decades, Saudi Arabia, Bahrain, Egypt, and the United Arab Emirates broke off relations with Qatar and ordered their citizens to leave Qatar, causing a negative impact on Qatar's economy. As a result, a slowdown occurred in the travel and tourism, trade, and banking industries. One of those negative effects was that Qatar Airways lost nearly 20% of its flight passenger seating capacity (Wachman, 2017). To account for this threat, I informed the reader that the archival data used in the current study might be subject to a history threat. This was presented in the limitations section (see "data sources and integrity") given in Chapter 1 and Chapter 5.

Maturation. A maturation threat refers to the extent to which the findings of a study were a function of changes that occurred within participants simply as a function of the passage of time. These include physiological, biological, and psychological changes individuals normally undergo as part of their aging process or due to the passage of time in the short-term, such as changes in hunger, wisdom, motivation, and fatigue. Because the current study used archival data, which were not acquired from any human subjects, and are relevant to a fixed 2-year period, the maturation threat was not applicable.

Testing. A testing threat refers to a situation in which participants are administered an assessment prior to treatment, and then the same assessment is administered after the treatment was given. The concern here is that the pre-

assessment could have sensitized participants in unanticipated ways, and as a result, performance on the post-assessment might be affected by participants' exposure to the pre-assessment. In other words, the pre-assessment cued participants about the post-assessment by giving them a "sneak peek" of the post-assessment. Because the current study used archival data and did not involve the administration of any pre- or post-assessments, the testing threat was not applicable.

Instrumentation. An instrumentation threat refers to changes in the way a dependent variable is measured throughout a study. "Changes may involve the type of measuring instrument, the difficulty level, the scorers, the way the tests are administered, using different observers for pre- and post-measures, and so on" (Ary et al., 2010, p. 275). In other words, an instrumentation threat to internal validity can be a function of: (a) instrument decay, which refers to changes made to the data collection instrument during a study; (b) data collector characteristics, which refer to changes in the characteristics of the person collecting the data, including age, gender, and ethnicity; or (c) data collector bias, which refers to the unconscious distortion of data by the data collector or scorer. In the context of the current study, because I used archival data I did not know if there were any changes to the data collection instrument or the data collector's characteristics, or whether data collector bias was present. As a result, the extent to which an instrumentation threat to internal validity was applicable to the current study is problematic. Nevertheless, it should be noted that the targeted data are used to inform political and economic

policies throughout the world, and hence are presumed to be free of the three main issues related to an instrumentation threat.

Statistical regression. A statistical regression threat refers to the tendency for extreme scores to move toward the mean on subsequent assessments. This is commonly referred to as the concept of "regression toward the mean." Because the current study used archival data and did not involve any types of assessments, the statistical regression threat was not applicable.

Selection. The selection threat refers to subject selection methods that can lead to comparison groups that are not equivalent at the outset of the study. In the context of a correlational study, it is defined as the possibility of selecting a sample that is not representative of the parent population. For example, in the context of the current study if countries (participants) are selected in such a way that only countries with at least a minimum land size or GDP level are sampled, then the results might be considerably different than if all countries were sampled. The current study examined a highly heterogeneous population, and if certain countries in that population were not included in the sample, the results could be affected. However, the current study entailed a census of the accessible population, and the number of countries in the accessible population was (a) representative of nearly 70% of the target population and (b) encompassed 98% of the target population's GDP. Furthermore, the only reason for a country being excluded is that it (or its

business executives) failed to provide necessary data. Therefore, the selection threat was not considered applicable to the current study.

Mortality. A mortality threat consists of a differential loss of participants (attrition) during the implementation of a study in such a way that the dependent variable is affected. This loss of participants could then lead to biased outcomes because the characteristics of the sample could change, making the sample no longer representative of the parent population. Furthermore, this loss of participants also could result in a reduction of statistical power, depending on the magnitude of the loss. The mortality threat was not applicable to the current study because I used archival data that were collected in a single snapshot without the possibility of differential loss of participants over the duration of the study. Additionally, as indicated earlier, the current study was a census of the accessible population, and the number of countries in the accessible population reflected nearly 70% of the target population.

Selection-maturation. The selection-maturation threat refers to the interaction between group membership and the maturation rates of the participants in the groups during a study. For example, if participants in the treatment group have a higher maturation rate than participants in the control group, it is logical that the observed outcome could be brought about by the different maturation rates rather than the treatment. As indicated earlier, neither the selection nor the

maturation threat was applicable to the current study and thus the selection-maturation threat also was not applicable.

Experimenter effect. An experimenter effect refers to the unintended bias or behavior of a researcher that affects the results of a study. This can result from the researcher's personal characteristics such as age, gender, and level of education, and could include the researcher's attitude toward the study or treatment. Because the current study (a) used archival data, (b) did not be place countries (participants) into treatment/control groups, and (c) did not involve an experimenter administering any type of treatment, the experimenter effect was not applicable to the current study.

Subject effects. A subject effects threat refers to participants' perception of the study and how this perception could affect the outcome of the study. This effect can be manifested either as a Hawthorne effect or as a John Henry effect. In the case of the former, the outcomes of the study would not be due to treatment, but rather would be the result of increased attention and recognition given to the participants in the treatment group. In other words, the participants in the treatment group might want to perform and exert more effort regardless of the treatment given to them because they feel honored they have been recognized to provide input. In the case of the latter, a John Henry effect refers to a situation in which subjects in a control group feel compelled to compete with the participants in a treatment group to show that they are "better" than those in the treatment group. These participants might feel resentful or demoralized because of the attention being given to the treatment

group. Because the current study used archival data and did not involve any human participants, the subject effects threat was not applicable.

Diffusion. The diffusion threat refers to the concept of design contamination, which occurs when participants in a treatment group share information about the treatment they are receiving with participants in the control group. This correspondence could influence the control group's performance. Because the current study did not involve human participants or groups of participants, the diffusion threat was not applicable.

Location. The location threat refers to the physical site at which data are collected that could provide an alternative explanation for the outcomes of a study. For example, if participants were given an instrument to respond to in a noisy, hot, and humid environment where they were interrupted frequently, their results might be different than if they were in a quiet, air-conditioned place with no interruptions. Because the current study used archival data, I do not know who, where, or how the study's data were collected or placed into the database. Although it is possible that a location threat might be a concern, I presumed all data collection and corresponding entries were conducted in a relatively comfortable and stress-free environment. As a result, the location threat was considered not to be relevant to the current study.

Treatment verification and fidelity. The concept of treatment verification and fidelity refers to what a researcher does to ensure that the independent variable is accurately manipulated or an intervention is accurately employed. It is a

"confirmation that the manipulation of the independent variable occurred as planned" (Moncher & Prinz, 1991, p. 247). Shaver (1983) reported that confirming, or verifying, that the actual implementation of the research maintained fidelity to what was proposed will enhance the integrity of the independent variables and help promote the generalizability of a study's results.

In the current study, there was no treatment and there was no manipulation of the independent variables. Therefore, the concern is not with treatment verification and fidelity in the traditional sense, but instead the focus is on external validity, which according to Shaver (1983) is concerned with complete descriptions of the variables, data collection procedures, and data analysis methods. To address these three issues in the current study, I prepared Table 3.2, which contains a detailed description of the variables, I documented the procedures in the Study Implementation section presented earlier in this chapter, and in the next section I summarize the statistical strategies I employed to analyze the data.

Data Analysis

Data analysis consisted of descriptive and inferential statistical procedures. The former was used to summarize descriptive information about the variables and consisted of calculating measures of central tendency (mean and median), and measures of variability (range and standard deviation), for the targeted variables corresponding to TTCI and PCAAWASK data. The results of these analyses are provided in Tables 4.1 through 4.5 in Chapter 4.

Table 3.2

Summary of Variables (See Also Figures 1.1 and 1.2 in Chapter 1)

Sets/Variables (Part A)	Description
Set A = Factor Conditions	
X_1 = Health and Hygiene	X_1 was part of the Enabling Environment subindex of the TTCI model and consisted of six indicators: physician density, access to improved sanitation, access to improved drinking water, hospital beds, HIV prevalence, and malaria incidence.
X_2 = Human Resources and Labor Market	X_2 was part of the Enabling Environment subindex of the TTCI model and consisted of nine indicators: primary and secondary education enrollment rates, extent of staff training, treatment of customers, hiring and firing practices, ease of finding skilled employees, ease of hiring foreign labor, pay and productivity, and female labor force participation.
X_3 = Information Communication Technology (ICT) Readiness	X_3 was part of the Enabling Environment subindex of the TTCI model and consisted of eight indicators: ICT use for business-to-business transactions, Internet use for business-to-consumer transactions, individuals using the Internet, broadband Internet subscribers, mobile telephone subscriptions, mobile broadband subscriptions, mobile network coverage, and quality of electricity supply.
X_4 = Natural Resources	X_4 was part of the Natural and Cultural Resources subindex of the TTCI model and consisted of five indicators: number of world heritage cultural sites, total known species, total protected areas, natural tourism digital demand, and attractiveness of natural assets
Set B = Firm Strategy, Structure, and Rivalry	
X_5 = Business Environment	X_5 was part of the Enabling Environment subindex of the TTCI model and consisted of 12 indicators: property rights, impact of rules on foreign direct investment, efficiency of legal frameworks in settling disputes, efficiency of legal frameworks in challenging regulations, time required to deal with construction permits, cost required to deal with construction permits extent of market dominance, time required to start a business, cost required to start a business, extent and effect of taxation on incentives to work, extent and effect of taxation on incentives to invest, and total tax rate.
X_6 = Environmental Sustainability	X_6 was part of the Policy and Enabling Conditions subindex of the TTCI model and consisted of 10 indicators: stringency of environment regulations, enforcement of environment regulations, sustainability of travel and tourism industry development, particulate matter (2.5) concentration, number of environmental treaty ratifications, baseline water stress, threatened species, forest cover change, wastewater treatment, and coastal shelf fishing pressure.

Note. X_1 –X_6 were measured on a 7-point Likert-type scale (1 = Least Competitive, 7 = Most Competitive).

Table 3.2 (Continued)

Summary of Variables (See Also Figures 1.1 and 1.2 in Chapter 1)

Sets/Variables (Part A)	Description
Set C = Demand Conditions	
X_{13} = Prioritization of Travel and Tourism	X_{13} was part of the Policy and Enabling Conditions subindex of the TTCI model and consisted of six indicators: government prioritization of the T&T industry, T&T government expenditure, effectiveness of marketing to attract tourists, comprehensiveness of annual T&T data, timeliness of providing monthly/quarterly T&T data, and country brand strategy rating.
X_{14} = Price Competitiveness	X_{14} was part of the Policy and Enabling Conditions subindex of the TTCI model and consisted of four indicators: ticket taxes and airport charges, hotel price index, purchasing power parity, and fuel price levels.
Set D = Related and Supporting Industries	
X_7 = Safety and Security	X_7 was part of the Enabling Environment subindex of the TTCI model and consisted of five indicators: business costs of crime and violence, reliability of police services, business costs of terrorism, index of terrorism incidents, and homicide rate.
X_8 = International Openness	X_8 was part of the Policy and Enabling Conditions subindex of the TTCI model and consisted of three indicators: visa requirements, openness of bilateral air service agreements, and number of regional trade agreements in force.
X_9 = Air Transport Infrastructure	X_9 was part of the Infrastructure subindex of the TTCI model and consisted of six indicators: quality of air transport infrastructure, available domestic seat kilometers, available international seat kilometers, aircraft departures, airport density, and number of operation airlines.
X_{10} = Ground and Port Infrastructure	X_{10} was part of the Infrastructure subindex of the TTCI model and consisted of seven indicators: quality of roads, road density, paved road density, quality of railroad infrastructure, railroad density, quality of port infrastructure, and ground transport efficiency.
X_{11} = Tourist Services Infrastructure	X_{11} was part of the Infrastructure subindex of the TTCI model and consisted of four indicators: hotel rooms, quality of tourism infrastructure, presence of major car rental companies, and automated teller machines per adult population
X_{12} = Cultural Resources and Business Travel	X_{12} was part of the Natural and Cultural Resources subindex of the TTCI model and consisted of five indicators: number of world heritage cultural sites, number of oral and intangible cultural heritage expressions, number of sports stadiums, number of international association meetings, and cultural and entertainment tourism digital demand.
Set *Y*	
Y = PCAAWASK	Y was the DV for Part B and represented the per capita annual average of weekly available seat kilometers.

Note. X_7–X_{14} were measured on a 7-point Likert-type scale (1 = Least Competitive, 7 = Most Competitive).

With respect to inferential statistics, I used a multivariate analysis of variance (MANOVA) approach in Part A to examine the relationships among the four dimensions within Porter's (1998) model. This strategy is appropriate for analyzing data that involves more than one dependent variable and more than one independent variables. A MANOVA approach also serves as an omnibus to control for the possibility of inflated Type I and Type II error rates. In the current study, the 14 TTCI factors alternated between being IVs and DVs, depending on the targeted analysis, and in all cases each DV contained more than one factor, which warranted a MANOVA strategy. For example, as illustrated in Figure 3.1, when examining the relationship between Set B and Sets A, C, and D, the two factors of Set B (X_5 and X_6) were IVs and the other 12 factors were DVs. However, when examining the reciprocal relationship, the two factors of Set B are now DVs. In those cases where a significant MANOVA model resulted, I then conducted follow-up univariate *F* tests. The results of these analyses are summarized in Tables 4.8–4.15 in Chapter 4.

In Part B of the study, I used a simultaneous multiple regression strategy to examine the relationship between the 14 TTCI factors and PCAAWASKs. The result of this analysis is summarized in Table 4.16 in Chapter 4. The reader is reminded that PCAAWASK refers to the per capita annual average of weekly available seat kilometers and represented passenger airline capacity in a country, which reflected a a measure of productivity. This metric, which is based on available seat kilometers (ASKs), is the product of the total number of passenger seats available on a flight

Figure 3.1. **An illustration of how factors alternate as IVs and DVs when examining reciprocal relationships. Because the DVs contain more than one factor, a MANOVA strategy was used.**

and the total number of kilometers flown on the flight. For example, an aircraft with 100 seats that flies 250 km generates 25,000 ASKs for that flight. The weekly sum of ASKs for all flights originating in a country, both domestic and international, taken by all airlines, is calculated for each week of the year and then averaged, resulting in that country's annual average of weekly available seat kilometers (AAWASKs). The per capita annual average of weekly available seat kilometers is then obtained by dividing AAWASKs for each country by the country's population to mitigate the effect of disparate population sizes among the countries.

Chapter 4

Results

Introduction

This chapter contains a discussion of the results from data analysis and is organized into three main sections: descriptive statistics, inferential statistics, and results of hypotheses testing. The first section provides a summary of the descriptive statistics results for all the variables corresponding to TTCI and the per capita of annual average of weekly available seat kilometers (PCAAWASK). The inferential statistics section contains two parts: (a) the results of various multivariate analysis of variance (MANOVA) and corresponding univariate follow-up analyses using multiple regression, which were used to examine the relationships among the four dimensions within Porter's (1998) reciprocal diamond model; and (b) the results of an exploratory analysis simultaneous multiple regression strategy, which was used to examine the relationship between the targeted TTCI factors and PCAAWASK. The last section contains a summary of the results of hypothesis testing that corresponded to the research hypotheses outlined in Chapter 1.

Descriptive Statistics

As illustrated in Figure 1.2 (Chapter 1), the Travel and Tourism Competitiveness Index is comprised of 14 factors partitioned into four separate categories: Enabling Environment, T&T Policy and Enabling Conditions,

Figure 4.1. **The 14 factors of the Travel and Tourism Competitiveness Index (TTCI). (*Source*: World Economic Forum, 2017a).**

Infrastructure, and Natural and Cultural Resources. A copy of Figure 1.2 is replicated here as Figure 4.1 for the reader's convenience. A summary of the results of descriptive statistics is provided here from (a) an overall perspective independent of each category and (b) relative to each of the four main categories, or subindexes. The reader is reminded that all factors were measured on 7-point Likert-type response scale ranging from 1 = Least Competitive to 7 = Most Competitive. The last part of this section provides a summary of the descriptive statistics associated with PCAAWASK, which corresponded to Research Question 2.

Overall results of the TTCI factors. As reported in Table 4.1, for the 136 countries of the world that comprised the 2017 TTCI, all countries had a mean

Table 4.1

Summary of Descriptive Statistics Results for the 14 TTCI Factors

Sets/Variables (Part A)	*M*	*Mdn*	*SD*
Set A = Factor Conditions			
X_1 = Health and Hygiene	5.12	5.40	1.23
X_2 = Human Resources and Labor Market	4.56	4.60	0.63
X_3 = Information Communication Technology (ICT) Readiness	4.41	4.10	1.22
X_4 = Natural Resources	3.26	3.00	1.00
Set B = Firm Strategy, Structure, and Rivalry			
X_5 = Business Environment	4.53	4.45	0.68
X_6 = Environmental Sustainability	4.18	4.10	0.56
Set C = Demand Conditions			
X_{13} = Prioritization of Travel and Tourism	4.49	4.60	0.83
X_{14} = Price Competitiveness	4.86	4.90	0.70
Set D = Related and Supporting Industries			
X_7 = Safety and Security	5.21	5.40	0.94
X_8 = International Openness	3.21	3.10	0.92
X_9 = Air Transport Infrastructure	3.00	2.60	1.19
X_{10} = Ground and Port Infrastructure	3.47	3.20	1.13
X_{11} = Tourist Services Infrastructure	4.06	4.10	1.29
X_{12} = Cultural Resources and Business Travel	2.32	1.70	1.41
Set *Y*			
Y = PCAAWASK[a]	55.0	15.2	95.6

Note. $N = 136$. The 14 TTCI factors are from TTCI (2017). All factors were measured on a 7-point Likert-type response scale ranging from 1 = Least Competitive to 7 = Most Competitive. The 14 TTCI factors also were partitioned into four sets, or dimensions of Porter's (1998) Diamond theory as shown in the table. See Figure 4.2 for additional information about these dimensions.
[a]PCAAWASK = Per Capita Annual Average of Weekly Available Seat Kilometers.

competitiveness score that was greater than the midrange of 4.0 for all factors except five. The five exceptions were X_4 = Natural Resources ($M_4 = 3.3$, $SD = 1.0$), X_8 = International Openness ($M_8 = 3.2$, $SD = 0.9$), X_9 = Air Transport Infrastructure ($M_9 = 3.0$, $SD = 1.2$), X_{10} = Ground and Port Infrastructure ($M_{10} = 3.5$, $SD = 1.1$), and X_{12} = Cultural Resources and Business Travel ($M_{12} = 2.3$, $SD = 1.4$). Based on

their means, these factors were the least competitive, with Cultural Resources and Business Travel having the smallest competitiveness index mean. Similarly, the two most competitiveness factors were X_1 = Health and Hygiene (M_1 = 5.1, SD = 1.2) and X_7 = Safety and Security (M_7 = 5.2, SD = 0.9). This means that on average most countries of the world have poor Cultural Resources and Business Travel conditions/opportunities but they also give greater attention to Health and Hygiene and Safety and Security.

With one exception, the respective distributions for the TCCI factors also had a skewness factor that was close to 0 and thus approximated a normal distribution. The only exception was X_{12} = Cultural Resources and Business Travel, which had a skewness factor of 1.74 and thus was skewed right. The reader also will note from Table 4.1 that the variability among the factors was relatively small.

TTCI subindex results. Tables 4.2–4.5 contain a summary of the descriptive statistics results per subindex by regions. A brief discussion of each subindex follows.

Enabling environment subindex. As reported in Table 4.2, the Enabling Environment subindex was comprised of five factors: X_5 = Business Environment, X_7 = Safety and Security, X_1 = Health and Hygiene, X_2 = Human Resources and Labor Market, and X_3 = Information Communication Technology (ICT) Readiness. When examined across the five regions, Europe and Eurasia was the most competitive region relative to this subindex for the four latter factors, with mean

Table 4.2

Summary of Descriptive Statistics Results of the 14 TTCI Factors by Regions for the Enabling Environment Subindex[a]

		X_5		X_7		X_1		X_2		X_3	
Region[b]	***N***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
A&P	22	4.8	0.66	5.3	0.97	5.2	0.77	4.7	0.59	4.5	1.25
E&E	46	4.7	0.62	5.7	0.61	6.2	0.38	5.0	0.43	5.2	0.83
ME&NA	15	4.8	0.65	5.2	1.13	5.3	0.57	4.3	0.56	4.8	1.03
SSA	30	4.2	0.55	4.8	0.77	3.3	0.74	4.0	0.52	3.0	0.75
The Americas	23	4.2	0.71	4.6	0.91	5.1	0.49	4.5	0.41	4.4	0.74
Overall	136	4.5	0.68	5.2	0.94	5.1	1.23	4.6	0.63	4.4	1.22

Note. $N = 136$. All factors are from TTCI (2017). All factors were measured on 7-point Likert-type response scale ranging from 1 = Least Competitive to 7 = Most Competitive. (See also Table 4.1.) The order of the factors follows the TTCI framework as illustrated in Figure 4.1.

[a]The Enabling Environment subindex consists of five factors: X_5 = Business Environment, X_7 = Safety and Security, X_1 = Health and Hygiene, X_2 = Human Resources and Labor Market, and X_3 = ICT Readiness. [b]A&P = Asia and the Pacific, E&E = Europe & Eurasia, ME&NA = Middle East & North Africa, SSA = Sub Saharan Africa. See Table 1.1 (Chapter 1) for additional information about the specific countries assigned to each region.

competitiveness index scores ranging from $M = 5.0$ ($SD = 0.43$) for X_2 to $M = 6.2$ ($SD = 0.38$) for X_1. Furthermore, the Europe and Eurasia region also had the second most competitive factor for X_5 with a mean score of $M = 4.7$ ($SD = 0.62$), which was one-tenth of a point smaller than the highest mean recorded by the Asia and Pacific and Middle East and North Africa regions. This indicates that the Europe and Eurasia region gives the most attention to the factors associated with the Enabling Environment subindex. The reader should also note that the Europe and Eurasia region also consists of the most countries ($n = 46$).

In contrast, the Sub Saharan Africa region, which consists of $n = 30$ countries, had the least competitiveness index score for four of the five factors of the Enabling Environment subindex: X_5 ($M = 4.2$, $SD = 0.55$), X_1 ($M = 3.3$, $SD = 0.74$), X_2 ($M = 4.0$, $SD = 0.52$), and X_3 ($M = 3.0$, $SD = 0.75$). The only exception

was with X_7, which had a mean competitiveness index score of $M = 4.8$ ($SD = 0.77$), which was the second lowest score among the regions. This indicates that the Sub Saharan Africa region gives the least attention to the factors associated with the Enabling Environment subindex. This implies the countries of this region have on average relatively poor health and hygiene conditions, poor business policies, unskilled human resources, and poor Internet communication technologies.

Enabling conditions subindex. As reported in Table 4.3, the Enabling Conditions subindex was comprised of four factors: X_{13} = Prioritization of Travel and Tourism, X_8 = International Openness, X_{14} = Price Competitiveness, and X_6 = Environmental Sustainability. When examined across the five regions, no single region was dominant/competitive. For example:

Table 4.3

Summary of Descriptive Statistics Results of the 14 TTCI Factors by Regions for the T&T Policy and Enabling Conditions Subindex[a]

		X_{13}		X_8		X_{14}		X_6	
Region[b]	***N***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
Asia and the Pacific	22	4.8	0.71	3.6	0.85	5.2	0.61	3.8	0.51
Europe & Eurasia	46	4.7	0.65	3.6	0.76	4.6	0.67	4.6	0.56
Middle East & North Africa	15	4.3	0.85	2.4	0.58	5.5	0.78	3.7	0.39
Sub Saharan Africa	30	3.9	0.88	2.4	0.59	4.8	0.46	4.2	0.30
The Americas	23	4.7	0.68	3.6	0.75	4.6	0.61	4.0	0.36
Overall	136	4.5	0.83	3.2	0.92	4.9	0.7	4.2	0.56

Note. $N = 136$. All factors are from TTCI (2017). All factors were measured on 7-point Likert-type response scale ranging from 1 = Least Competitive to 7 = Most Competitive. (See also Table 4.1.) The order of the factors follows the TTCI framework as illustrated in Figure 4.1.

[a]The T&T Policy and Enabling Conditions subindex consists of four factors: X_{13} = Prioritization of Travel & Tourism (T&T), X_8 = International Openness, X_{14} = Prior Competitiveness, and X_6 = Environmental Sustainability. [b]See Table 1.1 (Chapter 1) for additional information about the specific countries assigned to each region.

- With respect to X_{13}, the Asia and Pacific region was the most competitive with a mean index score of $M = 4.8$ ($SD = 0.71$).
- With respect to X_8, three regions—Asia and Pacific, Europe and Eurasia, and The Americas—were tied as the most competitive with an equivalent mean competitiveness index score of $M = 3.6$.
- With respect to X_{14}, the Middle East and North Africa region was the most competitive with a mean index score of $M = 5.5$ ($SD = 0.78$).
- With respect to X_6, the Europe and Eurasia region was the most competitive with a mean index score of $M = 4.6$ ($SD = 0.56$).

There also was no single region that was the least competitive relative to the four factors of the Enabling Conditions subindex. For example:

- The Sub Saharan Africa region had the smallest mean index score for X_{13} ($M = 3.9$, $SD = 0.88$) and for X_8 ($M = 2.4$, $SD = 0.59$). This implies that relative to travel and tourism, the 30 countries of this region, on average, give little priority to regulations and policies, and are less receptive to international policies such as visa requirements, bilateral air service agreements, and regional trade agreements.
- With respect to X_{14}, two regions—Europe and Eurasia and The Americas—were tied as the least competitive with an equivalent mean index score of $M = 4.6$. This implies that the countries that comprise these two regions, on average, are less competitive internationally with respect

to ticket taxes and airport charges, hotel prices, purchasing power, and fuel prices. This means that the countries in these regions are more expensive than the countries in the other regions relative to travel and tourism.

- With respect to X_6, the Middle East and North Africa region was the least competitive with a mean competitiveness index score of $M = 3.7$ ($SD = 0.39$). This implies that the countries of this region, on average, give little attention to conditions relative to environmental sustainability such as enforcement of environmental regulations, sustainability of travel and tourism industry development, and wastewater treatment.

Infrastructure subindex. As reported in Table 4.4, the Infrastructure subindex was comprised of three factors: X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{11} = Tourist Services Infrastructure. When examined across the five regions, Europe and Eurasia was the most competitive region relative to this subindex for the two latter factors, with mean index scores ranging from $M = 4.1$ ($SD = 1.05$) for X_{10} to $M = 4.9$ ($SD = 1.11$) for X_{11}. Furthermore, the Europe and Eurasia region also had the second most competitive factor for X_9 with a mean score of $M = 3.4$ ($SD = 1.09$), which was one-tenth of a point smaller than the highest mean recorded by the Asia and Pacific region. This indicates that the Europe and Eurasia region gives the most attention to the factors associated with the Enabling Environment subindex.

Table 4.4

***Summary of Descriptive Statistics Results of the 14 TTCI Factors by Regions for the* Infrastructure Subindex[a]**

		X_9		X_{10}		X_{11}	
Region[b]	***N***	***M***	***SD***	***M***	***SD***	***M***	***SD***
Asia and the Pacific	22	3.5	1.23	3.7	1.28	3.8	1.27
Europe & Eurasia	46	3.4	1.09	4.1	1.05	4.9	1.11
Middle East & North Africa	15	3.0	1.01	3.5	0.90	4.0	1.04
Sub Saharan Africa	30	2.0	0.54	2.6	0.59	2.8	0.77
The Americas	23	3.1	1.29	3.2	0.87	4.4	0.86
Overall	136	3.0	1.19	3.5	1.13	4.1	1.29

Note. $N = 136$. All factors are from TTCI (2017). All factors were measured on 7-point Likert-type response scale ranging from 1 = Least Competitive to 7 = Most Competitive. (See also Table 4.1.) The order of the factors follows the TTCI framework as illustrated in Figure 4.1. [a]The Infrastructure subindex consists of three factors: X_9 = Air Transport Infrastructure, X_{10} = Ground & Port Infrastructure, and X_{11} = Tourist Service Infrastructure. [b]See Table 1.1 (Chapter 1) for additional information about the specific countries assigned to each region.

In contrast, the Sub Saharan Africa region had the smallest mean index score for all three factors: X_9 ($M = 2.0$, $SD = 0.54$), X_{10} ($M = 2.6$, $SD = 0.59$), and X_{11} ($M = 2.8$, $SD = 0.77$). This implies that the 30 countries of this region, on average, give little attention to: (a) air transport infrastructure including airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international); (b) ground and port infrastructure conditions, including quality of roads, road density, railroad and port infrastructure, and ground transport efficiency; and (c) tourist service infrastructure, including hotel rooms, number of major car rental companies, and number of ATMs.

Natural and cultural resources subindex. As reported in Table 4.5, the Natural and Cultural Resources subindex was comprised of two factors: X_4 = Natural Resources and X_{12} = Cultural Resources and Business Travel. When examined across the five regions, no single region was dominant. For example:

Table 4.5

Summary of Descriptive Statistics Results of the 14 TTCI Factors by Regions for the Natural and Cultural Resources Subindex[a]

		X_4		X_{12}	
Region[b]	***N***	***M***	***SD***	***M***	***SD***
Asia and the Pacific	22	3.0	1.64	3.7	0.93
Europe & Eurasia	46	2.6	1.56	3.1	0.86
Middle East & North Africa	15	1.9	0.60	2.4	0.45
Sub Saharan Africa	30	1.4	0.43	3.1	0.77
The Americas	23	2.5	1.39	4.0	1.12
Overall	136	3.3	1.00	2.3	1.41

Note. $N = 136$. All factors are from TTCI (2017). All factors were measured on 7-point Likert-type response scale ranging from 1 = Least Competitive to 7 = Most Competitive. (See also Table 4.1.) The order of the factors follows the TTCI framework as illustrated in Figure 4.1.

[a]The Natural and Cultural Resources Subindex consists of two factors: X_4 = Natural Resources & Business Travel and X_{12} = Cultural Resources. [b]See Table 1.1 (Chapter 1) for additional information about the specific countries assigned to each region.

- With respect to X_4, the Asia and Pacific region was the most competitive with a mean index score of $M = 3.0$ ($SD = 1.64$). This implies that the countries of this region, on average, give greater attention to their respective natural resources such as increasing the number of natural World Heritage sites, improving the attractiveness of their natural assets, and increasing the percentage of protected areas.
- With respect to X_{12}, The Americas region was the most competitive with a mean index score of $M = 4.0$ ($SD = 1.12$). This implies that the countries of this region, on average, give greater attention to their cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment for tourism.

There also was no single region that was the least competitive relative to the two factors of the Natural and Cultural Resources subindex. For example:

- With respect to X_4, the Sub Saharan Africa region was the least competitive with a mean index score of $M = 1.4$ ($SD = 0.43$). This implies that the countries of this region, on average, give little attention to their respective natural resources.
- With respect to X_{12}, the Middle East & North Africa region was the least competitive with a mean index score of $M = 2.4$ ($SD = 0.45$). This implies that the countries of this region, on average, give little attention to their cultural resources and business travel conditions.

Overall results for PCAAWASK. As reported in Table 4.1, the mean per capita annual average weekly available seat kilometers (PCAAWASK) was $M = 55.0$ ($SD = 95.6$), with a range of 0.14 to 751.2. These data indicated a positively skewed distribution, which was confirmed by the corresponding skewness factor of 4.25. Because the extreme scores on the right influenced the mean, the median is a more appropriate central tendency measure than the mean. As a result, for 136 countries that comprised the 2017 TTCI, the "average" available airline seat capacity on a weekly basis per kilometer per individual was $Mdn = 15.2$. Because the more appropriate measure of central tendency for this variable was the median, I followed Tabachnick and Fidell's (2013) guidelines and transformed Y to Log base 10, which

resulted in a normal distribution. This is discussed further in the inferential statistics section relative to Research Question 2.

Inferential Statistics

Overview. The primary purpose of the current study was twofold. The first part (a) was to determine the extent to which the four dimensions of Porter's (1998) theoretical diamond model of International Competitiveness can be applied to the travel and tourism (T&T) industry. In other words, the focus was to determine if the TTCI factors had a significant reciprocal relationship among the four dimensions as posited by Porter's theory. The second part (b) was to examine the relationship between the factors that contributed to a country's international competitiveness in the T&T industry and the per capita passenger capacity of the combined domestic and international airline flights origination within that country.

The appropriate research methodology that was best aligned to the current study was an associational methodology, specifically, explanatory correlational. This design was appropriate because the study involved examining relationships among multiple factors associated with a single group (the countries of the world) and involved no manipulation. According to Iacobucci and Churchill (2015), a correlational research design is used to measure the closeness of the relationship between two or more variables. It describes in quantitative terms the degree to which variables are related and helps to examine the nature of the relationship between and among factors (Locks, Silverman, & Spirduso, 2010).

In the context of the current study, I examined the mutual relationship among the 14 contributing factors to international competitiveness in the T&T industry relative to Porter's (1998) diamond model of international competitiveness (Research Question 1). I also examined the relationship between the 14 TTCI factors and airline passenger capacity measured by the per capita annual average of weekly available seat kilometers (Research Question 2). The primary inferential statistical procedures for the former was a combination of multivariate analysis of variance (MANOVA) and corresponding univariate follow-up analyses using multiple regression. The primary inferential statistical procedure for the latter was simultaneous multiple regression.

Preliminary analyses. Prior to performing the primary analyses, I carried out several preliminary data screening activities to confirm that the dataset was "clean." These screening activities included modifying the initial dataset to prepare it for analysis, conducting outlier and missing data analyses, checking for multicollinearity, and confirming that the dataset was complaint with the assumptions of multiple regression. The following discussion highlights these activities. When appropriate, this discussion also is separated to distinguish between what was done for Research Question 1 and Research Question 2.

Dataset modifications. The reader is reminded that the current study's data were acquired from the World Economic Forum databases, which contained the 2017 edition of the Travel and Tourism Competitiveness Report. This database also

included each country's population as well as both domestic and international annual average of weekly available seat kilometers (AAWASK). No modification of the dataset was needed for Research Question 1. However, for Research Question 2, I added the domestic and international AAWASK together for each country and then divided by the country's population to obtain the per capita annual average of weekly available seat kilometers (PCAAWASK).

Missing data. Missing data did not occur because all countries in the accessible population had quantifiable measures associated with both TTCI scores and PCAAWASK figures.

Outlier analysis. Outliers are extreme "scores" (either high or low) relative to a given dataset and can involve either contaminated data or rare cases. The former are the result of an error in recording or entering data; the latter are valid but exceedingly rare observations in a sample. For example, in the context of the current study, a rare case might be a country that has scored very low score (less competitive) on International Openness Competitiveness because that country is extremely strict in permitting visas for international visitors.

To determine if any outliers were present, I examined the dataset using Jackknife distances of the targeted factors. This analysis flagged 11 outliers: Barbados, Canada, China, Colombia, Democratic Republic of the Congo, Hong Kong SAR, Iceland, Qatar, Singapore, Tajikistan, and United Arab Emirates. Given

the presumed integrity of the data contained within the World Economic Forum databases, I surmised these outliers to be rare cases.

Research question 1. To determine whether to keep or delete these outliers relative to Research Question 1, I regressed each of the 14 TTCI factors on the other 13 factors via a simultaneous regression strategy twice—one each in the presence and absence of the outliers—to examine the effect of the outliers. Except for two cases, the differences in key parameters such as R^2, Root Mean Square Error (*RMSE*), *F*, and *p* between outliers present vs. outliers absent were nearly identical, which implies that the outliers had no effect. The two exceptions were relative to X_4 = Natural Resources and X_{14} = Price Competitiveness. Although the respective outliers present and outliers absent models were significant for each factor, a stronger model resulted for X_4 with outliers present, and a stronger model resulted for X_{14} when outliers were absent. Given the scope of Research Question 1 relative to Porter's (1998) diamond theory model, where X_4 was part of the Factor Conditions set and X_{14} was part of the Demand part of the analysis, in analyses involving these two factors, the outliers had no effect. Therefore, I decided to retain the outliers because they had little impact on the final results.

Research question 2. To determine whether to keep or delete these outliers, I performed two separate simultaneous regression analyses—one each in the presence and absence of the outliers—with PCAAWASK as the dependent variable. With outliers present, the model was significant, $R^2 = .53$, root mean

square error (*RMSE)* = 81.00, $F(15, 121) = 9.67$, $p < .0001$. On the other hand, in the absence of the outliers, the model also was significant, $R^2 = .73$, *RMSE* = .24.42, $F(14, 110) = 21.13$, $p < .0001$. Although outliers absent yielded a stronger model, I decided to retain the outliers because of the prominence of these rare-case countries on the world stage. For example, both Canada and China are economic world powerhouses, and UAE's airport is considered one the busiest airports in the world. This decision to keep the outliers is listed as a delimitation to the study's results.

Multicollinearity. In any multivariate analysis, there is an assumption that each predictor has the potential to contribute in explaining the variability in the outcome variable. This assumption, however, will not be met if at least one predictor is highly correlated (e.g., $r > .8$) with another predictor. This concept in which two or more independent variables are highly correlated is referred to as multicollinearity, and the existence of multicollinearity can result in incorrect regression coefficients and large standard errors.

Research question 1. To check for multicollinearity in the current study's dataset relative to Research Question 1, I first examined the bivariate correlations for all 14 TTCI factors to get an idea of how these factors were related, which would give me some insight into possible multicollinearity problems. As shown in Table 4.6, X_3 = ICT Readiness was highly correlated with X_1 = Health and Hygiene ($r = .80$), X_2 = Human Resources and Labor Market ($r = .82$), X_9 = Air Transport Infrastructure ($r = .76$), X_{10} = Ground and Port Infrastructure ($r = .79$), and X_{11} =

Table 4.6

Correlation Matrix of the 14 TTCI Factors

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
X_1	1.00													
X_2	0.68	1.00												
X_3	0.80	0.82	1.00											
X_4	0.01	0.21	0.11	1.00										
X_5	0.37	0.72	0.68	-0.03	1.00									
X_6	0.31	0.48	0.47	0.08	0.41	1.00								
X_7	0.44	0.59	0.59	-0.05	0.58	0.50	1.00							
X_8	0.49	0.60	0.59	0.40	0.40	0.45	0.32	1.00						
X_9	0.55	0.72	0.76	0.39	0.63	0.33	0.40	0.57	1.00					
X_{10}	0.62	0.73	0.79	0.06	0.69	0.47	0.53	0.62	0.73	1.00				
X_{11}	0.69	0.72	0.85	0.31	0.54	0.49	0.45	0.66	0.77	0.71	1.00			
X_{12}	0.39	0.42	0.44	0.58	0.18	0.08	0.09	0.43	0.65	0.47	0.48	1.00		
X_{13}	0.46	0.58	0.58	0.28	0.52	0.27	0.40	0.62	0.56	0.55	0.67	0.27	1.00	
X_{14}	-0.17	-0.37	-0.32	-0.16	-0.24	-0.51	-0.23	-0.34	-0.31	-0.37	-0.44	-0.19	-0.25	1.00

Note. X_1 = Health & Hygiene, X_2 = Human Resources & Labor Market, X_3 = Internet Communication Technology (ICT) Readiness, X_4 = Natural Resources, X_5 = Business Environment, X_6 = Environmental Sustainability, X_7 = Safety & Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, X_{10} = Ground & Port Infrastructure, X_{11} = Tourist Services Infrastructure, X_{12} = Cultural Resources & Business Travel, X_{13} = Prioritization of T&T, X_{14} = Price Competitiveness.

Tourist Services Infrastructure (r = .85). Furthermore, X_{11} also was highly correlated with X_2 (r = .72), X_9 (r = .77), and X_{10} (r = .71). Therefore, I flagged X_3 and X_{11} as possible problem areas.

I next examined each predictor's variable inflation factor (*VIF*), which "provides an index of the amount that the variance of each regression coefficient is increased relative to a situation in which all the IVs are uncorrelated" (Cohen et al., 2003, pp. 421–422). The square root of the *VIF* indicates the amount of increase in the standard error of a regression coefficient compared against what would be expected if all the predictors were not correlated. For example, if an independent variable's *VIF* = 4, then this indicates that the corresponding standard error would be twice as high than it would be if the predictor was not correlated with any of the

other predictors in the model. To determine these *VIF*s I regressed each of the 14 TTCI factor on the other 13 factors and flagged those factors with *VIF* > 5. In every analysis, three factors consistently met this minimum *VIF*: X_2 = Human Resources and Labor Market, X_3 = ICT Readiness, and X_{11} = Tourist Service Infrastructure. As a result, I did not include these three factors in the final data set for Research Question 1.

Research question 2. To check for multicollinearity in the current study's dataset relative to Research Question 2, I regressed PCAAWASK on the 14 TTCI factors. The results of this analysis had two factors with high *VIF*s: X_3 and X_{11}. As a result, I did not include these two factors in the final data set for Research Question 2.

Statistical strategy assumptions. As noted earlier, the two statistical procedures were used to test the study's hypotheses: Multivariate Analysis of Variance (MANOVA) was used for Research Question 1, and multiple regression was used for Research Question 2. Independent of missing data, outliers, and multicollinearity, all of which were addressed in the preceding discussion, MANOVA assumptions include" (a) independence on the multiple DVs, (b) linear associations between pairs of DVs, (c) equal variances across populations involving the DVs, and (d) normally distributed DVs (Tabacnick & Fidell, 2013, Warner, 2008). According to Cohen et al. (2003), with the exception of (b) above, the assumptions of multiple regression also include those of MANOVA, but add a few more: correct specification of the independent variables, perfect reliability of the

IVs, and independence of the residuals. Following is a brief discussion of these assumptions and the methods used to confirm compliance relative to each research question.

Multivariate linearity. Multiple regression examines linear relationships among variables. Hence, it is important to determine whether the form of the relationship between IVs and DV is linear. The linearity assumption must be met from a multivariate viewpoint. Violation of these is assumption (i.e., a nonlinear relationship among measured variables) could result in biased estimates of the regression coefficient and standard errors.

To verify the linearity assumption for Research Question 1, I followed Warner's (2007) guidelines and examined the bivariate relationship between each of the factors within each set (dimension) to determine if the respective relationships were linear or not linear. For example, in Set A = Factor Conditions, I examined the relationship between X_1 = Health and Hygiene and X_4 = Natural Resources because these two factors will be DVs for analyses involving the effect of sets B, C, and D on Set A. In all cases, these relationships were linear.

To verify the linearity assumption for Research Question 2, I performed a multiple regression analysis where Y = PCAAWASK was regressed simultaneously on the 12 TTCI factors. I then conducted a residual analysis in which the residuals were plotted against the predicted values. The results of the analysis produced a discernable pattern, and the Kernel smoother line did not follow the trend of the

zero-line associated with the linear fit of the model. Thus, the dataset was not compliant with the multivariate linearity assumption.

Following Tabachnick and Fidell's (2013) guidelines, I transformed *Y* to Log base 10 and re-ran the regression analysis. The subsequent residual analysis resulted in no discernable pattern: The Kernel smoother line followed the trend of the zero-line associated with the linear fit of the model. When transforming a variable, Tabachnick and Fidell indicated, "it is important to check that the (transformed) variable is normally or near-normally distributed after transformation" (p. 86). As a result, I examined the skewness and kurtosis of both the untransformed distribution of *Y* as well as the Log base 10 of *Y.* For the untransformed distribution, skewness = 4.25 and kurtosis = 20.68. For the transformed distribution of *Y*, skewness = -0.10 and kurtosis = -0.17. Thus, the Log base 10 of *Y* was normally distributed, and these transformed scores were used to analyze the data for Research Question 2. The only issue in using these transformed scores is with interpreting the results. However, as noted by Tabachnick and Fidell, "…conclusions about means of transformed distributions apply to medians of untransformed distributions (and) for skewed distributions, the median is often a more appropriate measure of central tendency than the mean, anyway, so interpretations of differences in medians is appropriate" (p. 87). This was applicable to the current study with respect to Research Question 2 because the distribution of the PCAAWASK data was skewed. Thus, interpretations relative to

the results from analyzing the data for Research Question 2 will be made with respect to the median.

Correct specification of the IVs. This assumption was only applicable to Research Question 2, which involved the multiple regression analysis. The assumption refers to the notion that the independent variables included in the model truly belong in the model because of their relationship with the dependent measure. If any of the IVs are incorrectly specified, then this could lead to incorrect estimates of the regression coefficients, significance tests, and confidence intervals.

To determine if the variables were correctly specified, I examined leverage plots for the 12 TTCI factors. These plots were formed by (a) regressing Y on all the IVs except the targeted IV (X_T); (b) regressing X_T on all the other IVs; and (c) plotting the Y residuals, which represent that part of Y not associated with the IVs, against the X_T residuals. If the slope of the best-fitting regression line was zero, then the X_T was incorrectly specified. The leverage plots flagged four incorrectly specified factors: X_2 = Human Resources and Labor Market, X_4 = Natural Resources, X_7 = Safety and Security, and X_8 = International Openness. Therefore, these factors were removed from the final data set used for Research Question 2.

Perfect reliability. This assumption was only applicable to Research Question 2, which involved the multiple regression analysis. The assumption assumes that all the independent variables in the model are measured without error, which means that the instruments used to measure the independent variables are

reliable. If this assumption is violated, then measurement error could result in biased regression coefficients and standard errors, and incorrect confidence intervals. According to Cohen et al. (2003), reliability coefficients of at least .70 are acceptable in practice.

The current study did not use any type of formal data collection instrument. Instead, data were acquired from various publicly accessible web sites, namely, the 2017 edition of the Travel and Tourism Competitiveness Report (World Economic Forum, 2017a). Therefore, because I do not know how the data were acquired and stored, I was unable to assess or give attention to the reliability related to of the instruments that collected the IVs. However, this disadvantage is mitigated because of the presumed integrity of the data based on its usage: Various organizations and governments around the world use these data to make policy decisions.

Equal variances. This assumption states that the variance of the residuals around the calculated regression line remains constant regardless of any value of the independent variable. To verify the equal variances assumption for Research Question 1, I examined the results of the Levene test in SPSS relative to each respective analysis for the factors in each set (dimension). For example, with respect to Set A = Factor Conditions and Set B = Firm Strategy, Structure, and Rivalry, I ran a multivariate analysis with X_1 and X_4 as the IVs from Set A and X_5 and X_6 as the DVs from Set B, and vice versa, and then noted the results of the Levene test (Stevens, 2001, p. 269). As another example, with respect to Set C =

Demand Conditions and Set D = Related & Supporting Industries, I ran a multivariate analysis with X_{13}, X_{14} as the DVs from Set C, and X_7, X_8, X_9, X_{10}, X_{12} as the IVs from Set D, and vice versa, and then noted the results of the Levene test. In all cases except those IV $\rightarrow$ DV relationships noted below, the Levene test was satisfied:

- Set A to Set C:
  X_1 = Health and Hygiene $\rightarrow$ X_{13} = Prioritization of Travel and Tourism
  X_4 = Natural Resources $\rightarrow$ X_{13} = Prioritization of Travel and Tourism
- Set B to Set D:
  X_5 = Business Environment $\rightarrow$ X_{12} = Cultural Resources & Business Travel
  X_6 = Environmental Sustainability $\rightarrow$ X_{12} = Cultural Resources & Business Travel
- Set C to Set B:
  X_{13} = Prioritization of Travel and Tourism $\rightarrow$ X_5 = Business Environment
  X_{14} = Price Competitiveness $\rightarrow$ X_5 = Business Environment
- Set C to Set D:
  X_{14} = Price Competitiveness $\rightarrow$ X_{12} = Cultural Resources & Business Travel
- Set D to Set A:
  X_9 = Air Transport Infrastructure $\rightarrow$ X_4 = Natural Resources

According to Stevens (2001, p. 268), "…the *F* statistic is robust against heterogeneous variances when the group sizes are equal." Because I did not have any group membership variables (all factors were measured on a continuous scale),

the sample sizes were equal for all the IVs. Therefore, noncompliance with the equal variances assumption did not preclude me from proceeding with the corresponding analysis.

To verify the equal variances assumption for Research Question 2, I relied on the residual analysis that examined the scatter plot of the residuals versus predicted, which was used for the linearity assumption. As earlier noted, the assumption of linearity was met, and therefore the dataset was compliant with the homoscedasticity of residuals assumption for Research Question 2.

Independence of the residuals. This assumption was only applicable to Research Question 2, which involved the multiple regression analysis. The assumption requires there is no relationship among the residuals for any subset of cases in the analysis. In other words, the residuals of the observations must be independent of one another. Violation of this assumption can occur when multiple observations are made of a participant over time with a systematic change in the observations. Testing for this assumption involves examining a scatter plot of the residuals vs. the corresponding case numbers. Using the residuals from the transformed distribution of *Y* scores, no discernible pattern was observed. This was confirmed by the Kernel smoother line, which followed the trend of the zero line. Therefore, the data set for Research Question 2, which based on the transformed *Y* scores, was compliant with the independence of the residuals assumption.

Normality of the residuals. This assumption, which is applicable to both MANOVA (Research Question 1) and multiple regression (Research Question 2), indicates that any error represented by the residuals should be normally distributed for each set of values of the independent variables. This assumption helps to evaluate the statistical significance of the relationship between dependent and independent variables as reflected by the regression line.

To confirm this assumption relative to Research Question 1, I conducted the Shapiro-Wilk test of normality for the 11 TTCI factors of the final data set for Research Question 1, because at some point within the analysis each factor will be a dependent measure. (The reader is reminded that X_2, X_3, and X_{11} were deleted due to high multicollinearity.) Of these 11 factors, 4 yielded a normal distribution. These include the two factors of the Firm Strategy, Structure, and Rivalry dimension (Set B), and the two factors of the Demand Conditions dimension (Set C). Although the remaining seven factors were not normally distributed, because the sample sizes were relatively large ($N = 136$), "…the sampling distribution of F is only slightly affected, and therefore the critical values when sampling from normal and nonnormal distributions will not differ by much" (Stevens, 2001, p. 262).

To confirm the normality assumption relative to Research Question 2, I examined the Shapiro-Wilk test based on the Y Log Base 10 residuals. The result indicated the distribution approached a normal distribution, $W = .98$, $p = .0463$.

Although p was less than the preset alpha of $\alpha = .05$, the corresponding skewness factor was -0.07, and the corresponding *q-q* plot showed the majority of data points falling along the line of fit and confined within the 95% confidence band. As a result, I considered the data set for Research Question 2 to be compliant with the normality assumption.

Summary of preliminary analyses.

Research question 1. As a result of preliminary data screening, the final dataset for Research Question 1 was based on a sample size of $N = 136$ and included 11 outliers. Furthermore, X_2 = Human Resources and Labor Market, X_3 = ICT Readiness, and X_{11} =Tourist Service Infrastructure were removed to resolve multicollinearity issues.

Research question 2. Similar to the dataset for Research Question 1, the final dataset for Research Question 2 also was based on a sample size of $N = 136$ and included 11 outliers. However, this dataset also had two factors deleted due to multicollinearity (X_3 = ICT Readiness and X_{11} =Tourist Service), and another four factors were deleted because they were incorrectly specified as indicated by their respective leverage plots: X_2 = Human Resources and Labor Market, X_4 = Natural Resources, X_7 = Safety and Security, and X_8 = International Openness. Lastly, the reader is reminded that because the DV for Research Question 2 was skewed, Y = Per Capita Annual Average of Weekly Available Seat Kilometers (PCAAWASK)

Table 4.7

Summary of Variable Status As A Result of Preliminary Data Screening for Research Question 2

Initial Set of Factors	*Decision*[a]	*Reason/Rationale*[b]
X_1 = Health & Hygiene	Kept	–
X_2 = Human Resources & Labor Market	Deleted	Not correctly specified
X_3 = ICT Readiness	Deleted	Multicollinearity (X_1, X_2, X_9, X_{10}, X_{11})
X_4 = Natural Resources	Deleted	Not correctly specified
X_5 = Business Environment	Kept	
X_6 = Environmental Sustainability	Kept	–
X_7 = Safety & Security	Deleted	Not correctly specified
X_8 = International Openness	Deleted	Not correctly specified
X_9 = Air Transport Infrastructure	Kept	–
X_{10} = Ground & Port Infrastructure	Kept	–
X_{11} = Tourist Services Infrastructure	Deleted	Multicollinearity (X_3, X_9)
X_{12} = Cultural Resources & Business Travel	Kept	–
X_{13} = Prioritization of T&T	Kept	–
X_{14} = Price Competitiveness	Kept	–

Note. $N = 136$.

[a]Decision refers to whether or not a factor—after preliminary data screening—remained in the final model that was used to test the hypotheses associated with Research Question 2. [b]"Not correctly specified" refers to Regression Assumption 2 and means the factor's leverage plot showed no relationship with the Log base 10 of the dependent variable. "Multicollinearity" means the factor was highly correlated ($r > .75$) with the listed factors. Dashed items (–) denote no action taken because the factor was compliant with regression assumptions.

was transformed to Log Base 10. A summary of the results of data screening for Research Question 2 is presented in Table 4.7.

Primary analysis 1: Testing Porter's (1998) model. The first objective of the current study was to examine the reciprocal relationships of the TTCI factors relative to the four dimensions of Porter's (1998) Diamond model. A graphical illustration that juxtaposed the TTCI factors with Porter's Diamond model was provided in Figure 2.2 in Chapter 2 and is replicated here as Figure 4.2 for the reader's convenience. The reader is reminded that three TTCI factors—X_2, X_3, and

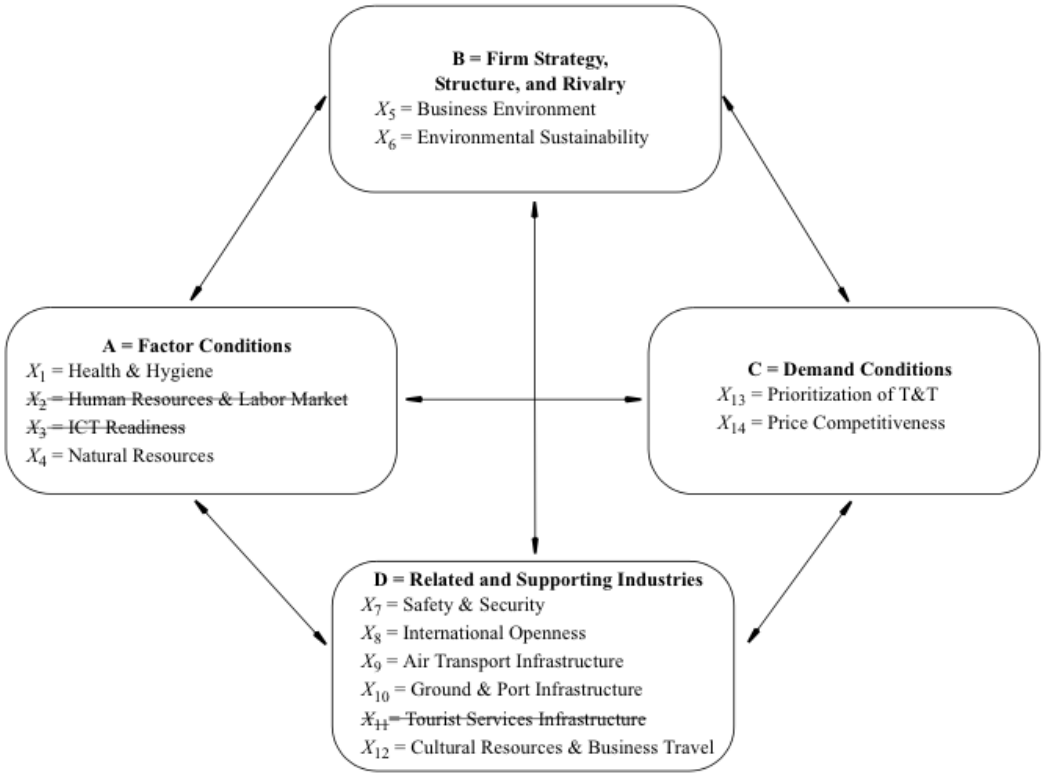


Figure 4.2. **The 14 factors that comprise the Travel and Tourism Competitiveness Index (TTCI) relative to Porter's (1998) diamond theory reciprocal model. The factors with a strikethrough (X_2, X_3, and X_{11}) were removed from the final model after preliminary data screening and therefore were not included in the final analysis.**

X_{11}—were removed from the final model after preliminary data screening. A brief summary of each analysis follows.

Dimension A's effect on dimensions B, C, and D: A→B, A→C, A→D. To examine the effect of A = Factor Conditions on B = Firm Strategy, Structure and Rivalry (A → B), C = Demand Conditions (A → C), and D = Related and Supporting Industries (A → D), I conducted a multivariate analysis of variance (MANOVA) via multiple regression with the factors of B (X_5 and X_6), of C (X_{13} and X_{14}), and of D (X_7, X_8, X_9, X_{10}, and X_{12}) as the dependent variables, and the factors

Table 4.8a

MANOVA Summary of A = Factor Conditions' Effect on: B = Firm Strategy, Structure, & Rivalry (A → B), C = Demand Conditions (A → C), and D = Related & Supporting Industries (A → D)

A = Factor Conditions	Eigenvalue	*F*	*df*	*p*
X_1 = Health and Hygiene	1.15	15.95	9, 125	< .0001***
X_4 = Natural Resources	1.56	21.61	9, 125	< .0001***

Note. $N = 136$. Whole model Wilks' $\Lambda = .20$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

of A (X_1 and X_4) as the independent variables (see Figure 4.2). The reason for performing a MANOVA was because the DV consisted of more than one variable and a MANOVA serves as an omnibus procedure to protect against inflated Type I and Type II errors. As reported in Table 4.8a the overall MANOVA model was significant, Wilks' $\Lambda = .20$, $p < .0001$, and the significance was with respect to both Factor Conditions variables (X_1 = Health and Hygiene and X_4 = Natural Resources). Consequently, I conducted nine independent follow-up univariate *F* tests, one for each dependent variable.

The effect of dimension A on dimension B (A→ B). As reported in Table 4.8b, two separate regression analyses were conducted. The first one involved regressing X_5 = Business Environment on the two factors of Dimension A (X_1 and X_4), and the second one involved regressing X_6 = Environmental Sustainability on X_1 and X_4. Both analyses were significant: $R^2 = .14$, $F(2, 133) = 10.40$, $p < .0001$; and $R^2 = .10$, $F(2, 133) = 7.59$, $p = .0008$. Thus, the two Factor Conditions variables collectively explained 14% of the variance in Business Environment scores, and they collectively explained 10% of the variance in Environmental Sustainability

Table 4.8b

Univariate Follow-up of MANOVA Results for the Effect of A = Factor Conditions on B = Firm Strategy, Structure, & Rivalry (A → B)

B = Firm Strategy, Structure, and Rivalry					
X_5 = Business Environment[a]					
A = Factor Conditions	***B***	***SE***	***t(133)***	***p***	**95% CI**
Intercept	3.56	0.29	12.05	< .0001***	[2.97, 4.14]
X_1 = Health and Hygiene	0.20	0.04	4.55	< .0001***	[0.12, 0.29]
X_4 = Natural Resources	-0.02	0.06	-0.36	.7167	[-0.13, 0.09]
X_6 = Environmental Sustainability[b]					
Intercept	3.30	0.25	13.34	< .0001***	[2.81, 3.79]
X_1 = Health and Hygiene	0.14	0.04	3.76	.0003***	[0.07, 0.22]
X_4 = Natural Resources	0.05	0.05	0.97	.3324	[-0.05, 0.14]

Note. $N = 136$.
[a]$R^2 = .14$, $F(2, 133) = 10.40$, $p < .0001$. [b]$R^2 = .10$, $F(2, 133) = 7.59$, $p = .0008$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

scores. Within each model, though, only X_1 = Health and Hygiene was significant. More specifically: When controlling for the effect of X_4 = Natural Resources, for every 1-unit increase in Health and Hygiene scores, Business Environment scores increased on average by 0.20 units, $B = 0.20$, $t(133) = 4.55$, $p < .0001$. Similarly, when controlling for the effect of X_4 = Natural Resources, for every 1-unit increase in Health and Hygiene scores, Environmental Sustainability scores increased on average by 0.14 units, $B = 0.14$, $t(133) = 3.76$, $p = .0003$. These findings indicate that as a country's regulations and policies relative to health and hygiene improve, the average scores for a country's business environment and environmental sustainability increase. In context of the current study, improvements to a country's health and hygiene conditions result in the country's better, improved, and more

efficient business environment regulations and policies as well an increased attention to sustaining its climate/environment.

The effect of dimension A on dimension C (A→ C). As reported in Table 4.8c, two separate regression analyses were conducted. The first one involved regressing X_{13} = Prioritization of T&T on the factors of Dimension A, X_1 and X_4, and the second one involved regressing X_{14} = Price Competitiveness on X_1 and X_4. Both analyses were significant: $R^2 = .28$, $F(2, 133) = 26.22$, $p < .0001$; and $R^2 = .05$, $F(2, 133) = 3.69$, $p = .0275$. Thus, the two Factor Conditions variables collectively explained 28% of the variance in Prioritization of T&T scores, and they collectively explained 5% of the variance in Price Competitiveness scores. In the first model, both factors were significant: (a) When controlling for the effect of X_4 = Natural

Table 4.8c

Univariate Follow-up of MANOVA Results for the Effect of A = Factor Conditions on C = Demand Conditions (A → C)

C = Demand Conditions X_{13} = Prioritization of T&T[a]					
A = Factor Conditions	***B***	***SE***	***t(133)***	***p***	**95% CI**
Intercept	2.17	0.33	6.65	< .0001***	[1.53, 2.82]
X_1 = Health and Hygiene	0.31	0.05	6.17	< .0001***	[0.21, 0.40]
X_4 = Natural Resources	0.23	0.06	3.72	.0003***	[0.11, 0.35]
X_{14} = Price Competitiveness[b]					
Intercept	5.70	0.32	18.05	< .0001***	[5.07, 6.32]
X_1 = Health and Hygiene	-0.09	0.05	-1.96	.0519	[-0.19, 0.00]
X_4 = Natural Resources	-0.11	0.06	-1.86	.0651	[-0.22, 0.01]

Note. $N = 136$.
[a]$R^2 = .28$, $F(2, 133) = 26.22$, $p < .0001$. [b]$R^2 = .05$, $F(2, 133) = 3.69$, $p = .0275$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

Resources, for every 1-unit increase in Health and Hygiene scores, Prioritization of T&T scores increased on average by 0.31 units, $B = 0.31$, $t(133) = 6.17$, $p < .0001$, and (b) when controlling for the effect of X_1 = Health and Hygiene, for every 1-unit increase in Natural Resources scores, Prioritization of T&T scores increased on average by 0.23 units, $B = 0.23$, $t(133) = 3.72$, $p = .0003$. In the second model, though, no factors were significant. These findings indicate that as a country's regulations and policies relative to health and hygiene or natural resources improve, the average scores for prioritizations of T&T increases. In the context of the current study, this implies that when a country gives increased attention to its health and hygiene conditions and/or natural resources, the country gives greater priority to regulations and policies relative to travel and tourism.

The effect of dimension A on dimension D (A→ D). As reported in Table 4.8d, five separate regression analyses were conducted in which each factor of Dimension D (X_7, X_8, X_9, X_{10}, and X_{12}) was regressed on the two factors of Dimension A (X_1 and X_4). Each respective analysis was significant:

- $R^2 = .20$, $F(2, 133) = 16.66$, $p < .0001$. Thus, the two Factor Conditions variables collectively explained 20% of the variance in Safety and Security scores.
- $R^2 = .40$, $F(2, 133) = 44.71$, $p < .0001$. Thus, the two Factor Conditions variables collectively explained 40% of the variance in International Openness scores.

Table 4.8d

Univariate Follow-up of MANOVA Results for the Effect of A = Factor Conditions on D = Related & Supporting Industries (A → D)

D = Related and Supporting Industries					
X_7 = Safety and Security[a]					
A = Factor Conditions	***B***	***SE***	***t(133)***	***p***	**95% CI**
Intercept	3.65	0.39	9.36	< .0001***	[2.88, 4.42]
X_1 = Health and Hygiene	0.34	0.06	5.73	< .0001***	[0.22, 0.46]
X_4 = Natural Resources	-0.06	0.07	-0.77	.4450	[-0.20, 0.09]
X_8 = International Openness[b]					
Intercept	0.14	0.33	0.43	.6685	[-0.51, 0.79]
X_1 = Health and Hygiene	0.37	0.05	7.29	< .0001***	[0.27, 0.46]
X_4 = Natural Resources	0.37	0.06	5.95	< .0001***	[0.24, 0.49]
X_9 = Air Transport Infrastructure[c]					
Intercept	-1.20	0.41	-2.89	.0044**	[-2.02, -0.38]
X_1 = Health and Hygiene	0.53	0.06	8.39	< .0001***	[0.40, 0.65]
X_4 = Natural Resources	0.46	0.08	5.94	< .0001***	[0.31, 0.61]
X_{10} = Ground and Port Infrastructure[d]					
Intercept	0.35	0.41	0.85	.3944	[-0.46 1.16]
X_1 = Health and Hygiene	0.57	0.06	9.12	< .0001***	[0.44, 0.69]
X_4 = Natural Resources	0.06	0.08	0.84	.4022	[-0.09, 0.22]
X_{12} = Cultural Resources[e]					
Intercept	-2.57	0.48	-5.41	< .0001***	[-3.51, -1.63]
X_1 = Health and Hygiene	0.44	0.07	6.10	< .0001***	[0.30, 0.58]
X_4 = Natural Resources	0.81	0.09	9.12	< .0001***	[0.63, 0.99]

Note. $N = 136$.
[a]$R^2 = .20$, $F(2, 133) = 16.66$, $p < .0001$. [b]$R^2 = .40$, $F(2, 133) = 44.71$, $p < .0001$. [c]$R^2 = .45$, $F(2, 133) = 53.37$, $p < .0001$. [d]$R^2 = .39$, $F(2, 133) = 42.04$, $p < .0001$. [e]$R^2 = .48$, $F(2, 133) = 60.74$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$

- $R^2 = .45$, $F(2, 133) = 5.37$, $p < .0001$. Thus, the two Factor Conditions variables collectively explained 45% of the variance in Air Transport Infrastructure scores.

- $R^2 = .39$, $F(2, 133) = 42.04$, $p < .0001$. Thus, the two Factor Conditions variables collectively explained 39% of the variance in Ground and Port Infrastructure scores.
- $R^2 = .48$, $F(2, 133) = 60.74$, $p < .0001$. Thus, the two Factor Conditions variables collectively explained 20% of the variance in Cultural Resources scores.

With respect to the first model, only X_1 = Health and Hygiene was significant: When controlling for the effect of X_4, for every 1-unit increase in Health and Hygiene scores, Safety and Security scores increased on average by 0.34 units, $B = 0.34$, $t(133) = 5.73$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to health and hygiene conditions improve, the average score for safety and security increases. In the context of the current study, this implies that improvements to a country's health and hygiene conditions also improve the country's safety and security conditions.

With respect to the second model, both X_1 = Health and Hygiene and X_4 = Natural Resources were significant: (a) When controlling for the X_4, for every 1-unit increase in Health and Hygiene scores, International Openness scores increased on average by 0.37 units, $B = 0.37$, $t(133) = 7.29$, $p < .0001$; and (b) when controlling for the effect of X_1, for every 1-unit increase in Natural Resources scores, International Openness scores increased on average by 0.37 units, $B = 0.37$, $t(133) = 5.95$, $p < .0001$. These findings indicate that as a country's regulations and

policies relative to health and hygiene conditions and/or natural resources improve, the average score of international openness increases. In the context of the current study, this implies that as a country's health and hygiene conditions and/or natural resources improve, the country becomes more receptive to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements.

With respect to the third model, both X_1 = Health and Hygiene and X_4 = Natural Resources were significant: (a) When controlling for the effect of X_4, for every 1-unit increase in Health and Hygiene scores, Air Transport Infrastructure scores increased on average by 0.53 units, $B = 0.53$, $t(133) = 8.39$, $p < .0001$; and (b) when controlling for the effect of X_1, for every 1-unit increase in Natural Resources scores, Air Transport Infrastructure scores increased on average by 0.46 units, $B = 0.46$, $t(133) = 5.94$, $p < .0001$. These findings indicate that as a country's regulations and policies relative to health and hygiene conditions and/or natural resources improve, the average score of air transport infrastructure increases. In the context of the current study, this implies that as a country's health and hygiene conditions and/or natural resources improve, the country becomes more receptive to increasing its air transport infrastructure including airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international).

With respect to the fourth model, only X_1 = Health and Hygiene was significant: When controlling for the effect of X_4, for every 1-unit increase in Health and Hygiene scores, Ground and Port Infrastructure scores increased on average by 0.57 units, $B = 0.57$, $t(133) = 9.12$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to health and hygiene conditions improve, the average score of ground and port infrastructure increases. In the context of the current study, this implies that as a country's health and hygiene conditions improve, there is an increase in the country's regulations and policies toward ground and port infrastructure conditions including the quality of roads, road density, railroad and port infrastructure, and ground transport efficiency.

With respect to the fifth model, both X_1 = Health and Hygiene and X_4 = Natural Resources were significant: (a) When controlling for the effect of X_4, for every 1-unit increase in Health and Hygiene scores, Cultural Resources scores increased on average by 0.44 units, $B = 0.44$, $t(133) = 6.10$, $p < .0001$; and (b) when controlling for the effect of X_1, for every 1-unit increase in Natural Resources scores, Cultural Resources scores increased on average by 0.81 units, $B = 0.81$, $t(133) = 9.12$, $p < .0001$. These findings indicate that as a country's regulations and policies relative to health and hygiene conditions and/or natural resources improve, the average score of cultural resources and business travel increases. In the context of the current study, this implies that as a country's health and hygiene conditions and/or natural resources improve, there is an increase in the country's regulations

and policies toward cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment for tourism.

Dimension B's effect on dimensions A, C, and D: B→A, B→C, B→D. To examine the effect of B = Firm Strategy, Structure, and Rivalry on A = Factor Conditions (B → A), C = Demand Conditions (B → C), and D = Related and Supporting Industries (B → D), I conducted a multivariate analysis of variance (MANOVA) via multiple regression with the factors of A (X_1 and X_4), C (X_{13} and X_{14}), and of D (X_7, X_8, X_9, X_{10}, and X_{12}) as the dependent variables, and the factors of B (X_5 and X_6) as the independent variables (see Figure 4.2). As reported in Table 4.9a the overall MANOVA model was significant, Wilks' $\Lambda = .20$, $p < .0001$, and the significance was with respect to both Firm Strategy, Structure, and Rivalry variables (X_5 = Business Environment and X_6 = Environmental Sustainability). Consequently, I conducted nine independent follow-up univariate *F* tests, one for each dependent variable.

Table 4.9a

MANOVA Summary of B =Firm Strategy, Structure, & Rivalry's Effect on: A = Factor Conditions (B → A), C = Demand Conditions (B → C), and D = Related & Supporting Industries (B → D)

B = Firm Strategy, Structure, & Rivalry	Eigenvalue	*F*	*df*	*p*
X_5 = Business Environment	1.49	20.62	9, 125	< .0001***
X_6 =Environmental Sustainability	0.66	9.15	9, 125	< .0001***

Note. $N = 136$. Whole model Wilks Lambda, $\Lambda = .20$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4.9b

Univariate Follow-up of MANOVA Results for the Effect of B = Firm Strategy, Structure, & Rivalry on A = Factor Conditions (B → A)

A = Factor Conditions X_1 = Health and Hygiene[a]					
B = Firm Strategy, Structure, and Rivalry	***B***	***SE***	***t(133)***	***p***	**95% CI**
Intercept	1.02	0.83	1.23	.2210	[-0.62, 2.65]
X_5 = Business Environment	0.52	0.16	3.32	.0012*	[0.21, 0.83]
X_6 = Environmental Sustainability	0.42	0.19	2.22	.0281*	[0.05, 0.80]
X_4 = Natural Resources[b]					
Intercept	2.90	0.73	3.97	.0001***	[1.45, 4.34]
X_5 = Business Environment	-0.10	0.14	-0.75	.4524	[-0.38, 0.17]
X_6 = Environmental Sustainability	0.20	0.17	1.19	.2371	[-0.13, 0.53]

Note. $N = 136$.
[a]$R^2 = .17$, $F(2, 133) = 13.17$, $p < .0001$. [b]$R^2 = .01$, $F(2, 133) = .749$, $p = .4749$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

The effect of dimension B on dimension A (B → A). As reported in Table 4.9b, two separate regression analyses were conducted. The first one involved regressing X_1 = Health and Hygiene on the two factors of Dimension B (X_5 and X_6), and the second one involved regressing X_4 = Natural Resources on X_5 and X_6. Both analyses were significant: $R^2 = .17$, $F(2, 133) = 13.17$, $p < .0001$; and $R^2 = .01$, $F(2, 133) = .749$, $p = .4749$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained 17% of the variance in Health and Hygiene scores, and they collectively explained 1% of the variance in Natural Resources scores. Within the first model, both X_5 = Business Environment and X_6 = Environmental Sustainability were significant. More specifically: When controlling for the effect of X_6 = Environmental Sustainability, for every 1-unit increase in Business

Environment scores, Health and Hygiene scores increased on average by 0.52 units, $B = 0.52$, $t(133) = 3.32$, $p = .0012$. Similarly, when controlling for the effect of X_5 = Business Environment, for every 1-unit increase in Environmental Sustainability scores, Health and Hygiene scores increased on average by 0.42 units, $B = 0.42$, $t(133) = 2.22$, $p = .0281$. These findings indicate that as a country's regulations and policies relative to its business environment and/or environmental sustainability improve, the average health and hygiene score increases. In the context of the current study, this implies that countries with an increased attention to its business environment policies and/or environmental sustainability conditions have more favorable health and hygiene conditions. Within the second model, although it too was significant, none of the Firm Strategy, Structure, and Rivalry variables was significant.

The effect of dimension B on dimension C ($B \rightarrow C$). As reported in Table 4.9c, two separate regression analyses were conducted. The first one involved regressing X_{13} = Prioritization of T&T on the two factors of Dimension B (X_5 and X_6), and the second one involved regressing X_{14} = Price Competitiveness on X_5 and X_6. Both analyses were significant: $R^2 = .27$, $F(2, 133) = 24.92$, $p < .0001$; and $R^2 = .26$, $F(2, 133) = 23.01$, $p < .0001$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained 27% of the variance in Prioritization of T&T scores, and they collectively explained 26% of the variance in Price Competitiveness scores.

Table 4.9c

Univariate Follow-up of MANOVA Results for the Effect of B = Firm Strategy, Structure, & Rivalry on C = Demand Conditions (B → C)

C = Demand Conditions X_{13} = Prioritization of T&T[a]					
B = Firm Strategy, Structure, and Rivalry	***B***	***SE***	***t(133)***	***p***	**95% CI**
Intercept	1.33	0.52	2.55	.0119*	[0.30, 2.36]
X_5 = Business Environment	0.59	0.10	6.00	< .0001***	[0.40, 0.79]
X_6 = Environmental Sustainability	0.11	0.12	0.95	.3434	[-0.12, 0.35]
X_{14} = Price Competitiveness[b]					
Intercept	7.58	0.44	17.16	< .0001***	[6.71, 8.45]
X_5 = Business Environment	-0.04	0.08	-0.51	.6138	[-0.21, 0.12]
X_6 = Environmental Sustainability	-0.61	0.10	-5.97	< .0001*	[-0.81, -0.41]

Note. $N = 136$.
[a]$R^2 = .27$, $F(2, 133) = 24.92$, $p < .0001$. [b]$R^2 = .26$, $F(2, 133) = 23.01$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

Within the first model, only X_5 = Business Environment was significant. More specifically: When controlling for the effect of X_6 = Environmental Sustainability, for every 1-unit increase in Business Environment scores, Prioritization of T&T scores increased on average by 0.59 units, $B = 0.59$, $t(133) = 6.00$, $p < .0001$. Within the second model, only X_6 = Environmental Sustainability was significant. More specifically: When controlling for the effect of X_5 = Business Environment, for every 1-unit increase in Environmental Sustainability scores, Price Competitiveness scores decreased on average by 0.61 units, $B = -0.61$, $t(133) = -5.97$, $p < .0001$. These findings indicate that as a country's regulations and policies relative to the conditions of business environment improve, the average score for prioritization of T&T increases. Also, as a country's regulations

and policies relative to the conditions of environmental sustainability improve, the average score for price competitiveness decreases. In the context of the current study, this implies that as countries increase their attention to their business environment policies, they also give greater priority and attention to regulations and policies relative to travel and tourism including government expenditure, marketing efforts, and branding strategy.

The effect of dimension B on dimension D (B → D). As reported in Table 4.9d, five separate regression analyses were conducted in which each factor of Dimension D (X_7, X_8, X_9, X_{10}, and X_{12}) was regressed on the two factors of Dimension B (X_5 and X_6). The result of each respective analysis follows:

- $R^2 = .41$, $F(2, 133) = 46.95$, $p < .0001$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained 41% of the variance in Safety and Security scores. This was significant.
- $R^2 = .26$, $F(2, 133) = 23.15$, $p < .0001$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained 26% of the variance in International Openness scores. This was significant.
- $R^2 = .41$, $F(2, 133) = 45.98$, $p < .0001$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained 41% of the variance in in Air Transport Infrastructure scores. This was significant.

Table 4.9d

Univariate Follow-up of MANOVA Results for the Effect of B = Firm Strategy, Structure, & Rivalry on D = Related & Supporting Industries (B → D)

D = Related and Supporting Industries					
X_7 = Safety and Security[a]					
B = Firm Strategy, Structure, and Rivalry	***B***	***SE***	***t(133)***	***p***	**95% CI**
Intercept	0.23	0.53	0.43	.6713	[-0.82, 1.27]
X_5 = Business Environment	0.61	0.10	6.14	< .0001***	[0.42, 0.81]
X_6 = Environmental Sustainability	0.53	0.12	4.34	< .0001***	[0.29, 0.77]
X_8 = International Openness[b]					
Intercept	-0.70	0.58	-1.24	.2179	[-1.90, 0.43]
X_5 = Business Environment	0.35	0.11	3.21	.0017**	[0.14, 0.57]
X_6 = Environmental Sustainability	0.56	0.13	4.17	< .0001***	[0.29, 0.82]
X_9 = Air Transport Infrastructure[c]					
Intercept	-2.50	0.68	-3.76	.0003***	[-3.88, -1.20]
X_5 = Business Environment	1.05	0.13	8.19	< .0001***	[0.80, 1.30]
X_6 = Environmental Sustainability	0.19	0.16	1.22	.2246	[-0.12, 0.50]
X_{10} = Ground and Port Infrastructure[d]					
Intercept	-2.88	0.58	-4.99	< .0001*	[-4.03, -1.74]
X_5 = Business Environment	0.98	0.11	8.94	< .0001***	[0.76, 1.19]
X_6 = Environmental Sustainability	0.46	0.13	3.47	.0007***	[0.20, 0.72]
X_{12} = Cultural Resources & Business Travel[e]					
Intercept	0.57	1.02	0.56	.5781	[-1.45, 2.60]
X_5 = Business Environment	0.36	0.19	1.86	.0646	[-0.02, 0.74]
X_6 = Environmental Sustainability	0.03	0.24	0.12	.9065	[-0.44, .49]

Note. $N = 136$.
[a]$R^2 = .41$, $F(2, 133) = 46.95$, $p < .0001$. [b]$R^2 = .26$, $F(2, 133) = 23.15$, $p < .0001$. [c]$R^2 = .41$, $F(2, 133) = 45.98$, $p < .0001$. [d]$R^2 = .51$, $F(2, 133) = 70.21$, $p < .0001$. [e]$R^2 = .03$, $F(2, 133) = 2.20$, $p = .1151$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

- $R^2 = .51$, $F(2, 133) = 70.21$, $p < .0001$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained 51% of the variance in Ground and Port Infrastructure scores. This was significant.

- $R^2 = .03$, $F(2, 133) = 2.20$, $p = .1151$. Thus, the two Firm Strategy, Structure, and Rivalry variables collectively explained only 3% of the variance in Cultural Resources scores. This was not significant.

With respect to the first model, both X_5 = Business Environment and X_6 = Environmental Sustainability were significant: (a) When controlling for the effect of X_6, for every 1-unit increase in Business Environment scores, Safety and Security scores increased on average by 0.61 units, $B = 0.61$, $t(133) = 6.14$, $p < .0001$; and (b) When controlling for the effect of X_5, for every 1-unit increase in Environmental Sustainability scores, Safety and Security scores increased on average by 0.53 units, $B = 0.53$, $t(133) = 4.34$, $p < .0001$. These findings indicate that as a country's regulations and policies relative to the conditions of business environment and/or environmental sustainability improve, the average score for safety and security increases. In the context of the current study, this implies that countries with an increased attention to their business environment policies and/or environmental sustainability conditions increase their attention to safety and security issues such as business costs of crime, violence, and terrorism, homicide rates, and reliable police services.

With respect to the second model, both X_5 = Business Environment and X_6 = Environmental Sustainability were significant: (a) When controlling for the effect of X_6, for every 1-unit increase in Business Environment scores, International Openness scores increased on average by 0.35 units, $B = 0.35$, $t(133) = 3.21$, $p =$

.0017; and (b) when controlling for the effect of X_5, for every 1-unit increase in Environmental Sustainability scores, International Openness scores increased on average by 0.56 units, $B = 0.56$, $t(133) = 4.17$, $p < .0001$. These findings indicate that as a country's regulations and policies relative to the conditions of business environment and/or environmental sustainability improve, the average score of international openness increases. In the context of the current study, this implies that countries with an increased attention to their business environment policies and/or environmental sustainability conditions give greater attention to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements.

With respect to the third model, only X_5 = Business Environment was significant: When controlling for the effect of X_6 for every 1-unit increase in Business Environment scores, Air Transport Infrastructure scores increased on average by 1.05 units, $B = 1.05$, $t(133) = 8.19$, $p < .0001$. This finding suggests that as a country's regulations and policies relative to the conditions of business environment improve, the average score for air transport infrastructure increases. In the context of the current study, this implies that as a country's business environment improves, the country becomes more receptive to increasing its air transport infrastructure including airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international).

With respect to the fourth model, both X_5 = Business Environment and X_6 = Environmental Sustainability were significant: (a) When controlling for the effect of X_6, for every 1-unit increase in Business Environment scores, Ground and Port Infrastructure scores increased on average by 0.98 units, $B = 0.98$, $t(133) = 8.94$, $p < .0001$; and (b) when controlling for the effect of X_5, for every 1-unit increase in Environmental Sustainability scores, Ground and Port Infrastructure scores increased on average by 0.46 units, $B = 0.46$, $t(133) = 3.47$, $p = .0007$. These findings indicate that as a country's regulations and policies relative to the conditions of business environment and/or environmental sustainability improve, the average score of ground and port infrastructure increases. In the context of the current study, this implies that as a country's business environment policies and/or environmental sustainability conditions improve, there is an increase in the country's regulations and policies toward ground and port infrastructure conditions including the quality of roads, road density, railroad and port infrastructure, and ground transport efficiency.

Dimension C's effect on dimensions A, B, and D: C→A, C→B, C→D. To examine the effect of C = Demand Conditions on A = Factor Conditions (C → A), B = Firm Strategy, Structure and Rivalry (C → B), and D = Related and Supporting Industries (C → D), I conducted a multivariate analysis of variance (MANOVA) via multiple regression with the factors of A (X_1 and X_4), B (X_5 and X_6), and of D (X_7, X_8, X_9, X_{10}, and X_{12}) as the dependent variables, and the factors of C (X_{13} and

Table 4.10a

MANOVA Summary of C = Demand Conditions' Effect on: A = Factor Conditions (C → A); B = Firm Strategy, Structure, & Rivalry (C → B); and Set D = Related & Supporting Industries (C → D)

C = Demand Conditions	Eigenvalue	*F*	*df*	*p*
X_{13} = Prioritization of T&T	1.04	14.50	9, 125	< .0001***
X_{14} = Price Competitiveness	0.36	5.00	9, 125	< .0001***

Note. $N = 136$. Whole model Wilks' $\Lambda = .34$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

X_{14}) as the independent variables (see Figure 4.2). As reported in Table 4.10a the overall MANOVA model was significant, Wilks' $\Lambda = .34$, $p < .0001$, and the significance was with respect to both Demand Conditions variables (X_{13} = Prioritization of T&T and X_{14} = Price Competitiveness). Consequently, I conducted nine independent follow-up univariate *F* tests, one for each dependent variable.

The effect of dimension C on dimension A (C→ A). As reported in Table 4.10b, two separate regression analyses were conducted. The first one involved regressing X_{13} = Prioritization of T&T on the two factors of Dimension A (X_1 and X_4), and the second one involved regressing X_{14} = Price Competitiveness on X_1 and X_4. Both analyses were significant: $R^2 = .21$, $F(2, 133) = 17.79$, $p < .0001$; and $R^2 = .09$, $F(2, 133) = 6.24$, $p = .0026$. Thus, the two Demand Conditions variables collectively explained 21% of the variance in Health and Hygiene scores, and they collectively explained 9% of the variance in Natural Resources scores. Within each model, though, only X_{13} = Prioritization of T&T was significant. More specifically: When controlling for the effect of X_{14} = Price Competitiveness, for every 1-unit increase in Prioritization of T&T scores, Health and Hygiene scores increased on

Table 4.10b

Univariate Follow-up of MANOVA Results for the Effect of C = Demand Conditions on A = Factor Conditions (C → A)

A = Factor Conditions					
	X_1 = Health and Hygiene[a]				
C = Demand Conditions	***B***	***SE***	***t(134)***	***p***	**95% CI**
Intercept	2.67	0.97	2.77	.0064**	[0.76, 4.58]
X_{13} = Prioritization of T&T	0.65	0.12	5.56	< .0001***	[0.42, 0.89]
X_{14} = Price Competitiveness	-0.10	0.14	-0.71	.4806	[-0.38, 0.18]
	X_4 = Natural Resources[b]				
Intercept	2.55	0.84	3.02	.0031**	[0.88 4.21]
X_{13} = Prioritization of T&T	0.31	0.10	2.97	.0035**	[0.10, 0.51]
X_{14} = Price Competitiveness	-0.14	0.12	-1.11	.2696	[-0.38, 0.11]

Note. $N = 136$.
[a]$R^2 = .21$, $F(2, 133) = 17.79$, $p < .0001$. [b]$R^2 = .09$, $F(2, 133) = 6.24$, $p = .0026$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

average by 0.65 units, $B = 0.65$, $t(133) = 5.56$, $p < .0001$. Similarly, when controlling for the effect of X_{14} = Price Competitiveness, for every 1-unit increase in X_{13} = Prioritization of T&T scores, Natural resources scores increased on average by 0.31 units, $B = 0.31$, $t(133) = 2.97$, $p = .0035$. These findings indicate that as a country gives higher priority to regulations and policies relative to its travel and tourism industry, the average scores for both health and hygiene and natural resources increase. In the context of the current study, this implies that by giving higher priority to travel and tourism impacts positively a country's health and hygiene conditions as well as the efficient use of its natural resources.

The effect of dimension C on dimension B (C→ B). As reported in Table 4.10c, two separate regression analyses were conducted. The first one involved regressing X_5 = Business Environment on the two factors of Dimension C (X_{13} and

Table 4.10c

Univariate Follow-up of MANOVA Results for the Effect of C = Demand Conditions on B = Firm Strategy, & Rivalry (C → B)

B = Firm Strategy, Structure, and Rivalry X_5 = Business Environment[a]					
C = Demand Conditions	***B***	***SE***	***t(134)***	***p***	**95% CI**
Intercept	3.30	0.51	6.44	< .0001***	[2.29, 4.31]
X_{13} = Prioritization of T&T	0.40	0.06	6.42	< .0001***	[0.28, 0.52]
X_{14} = Price Competitiveness	-0.12	0.07	-1.55	.1225	[-0.26, 0.03]
X_6 = Environmental Sustainability[b]					
Intercept	5.52	0.42	13.07	< .0001***	[4.69, 6.36]
X_{13} = Prioritization of T&T	0.11	0.05	2.08	.0397*	[0.01, 0.21]
X_{14} = Price Competitiveness	-0.38	0.06	-6.13	< .0001***	[-0.50, -0.25]

Note. $N = 136$.
[a]$R^2 = .28$, $F(2, 133) = 25.95$, $p < .0001$. [b]$R^2 = .28$, $F(2, 133) = 25.74$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

X_{14}), and the second one involved regressing X_6 = Environmental Sustainability on X_{13} and X_{14}. Both analyses were significant: $R^2 = .28$, $F(2, 133) = 25.95$, $p < .0001$; and $R^2 = .28$, $F(2, 133) = 25.74$, $p < .0001$. Thus, the two Demand Conditions variables collectively explained 28% of the variance in X_5 = Business Environment as well as in X_6 = Environmental Sustainability scores. In the first model, only X_{13} = Prioritization of T&T was significant: When controlling for the effect of X_{14} = Price Competitiveness, for every 1-unit increase in Prioritization of T&T scores, Business Environment scores increased on average by 0.40 units, $B = 0.40$, $t(133) = 6.42$, $p < .0001$. In the second model, both Demand Conditions variables were significant: (a) When controlling for the effect of X_{14} = Price Competitiveness, for every 1-unit increase in Prioritization of T&T scores, Environmental Sustainability scores increased on average by 0.11 units, $B = 0.11$, $t(133) = 2.08$, $p = .0397$, and (b) when

controlling for the effect of X_{13} = Prioritization of T&T, for every 1-unit increase in Price Competitiveness scores, Environmental Sustainability scores decreased on average by 0.83 units, B = -0.38, $t(133)$ = -6.13, $p < .0001$. In the second model, though, no factors were significant. These findings indicate that as a country's regulations and policies relative to how it prioritizes its travel and tourism improve, the average scores for both business environment and environmental sustainability increase. In the context of the current study, this implies that countries that give its travel and tourism industry high priority also have improved business environment policies and environmental sustainability conditions.

These findings also indicate that as a country becomes more cost-competitive relative to its travel and tourism costs, the average score of environmental sustainability decreases. In other words, as a country becomes more competitive internationally with respect to ticket taxes and airport charges, hotel prices, purchasing power, and fuel prices, its policies/conditions toward environmental sustainability suffer.

The effect of dimension C on dimension D (C→ D). As reported in Table 4.10d, five separate regression analyses were conducted in which each factor of Dimension D (X_7, X_8, X_9, X_{10}, and X_{12}) was regressed on the two factors of Dimension C (X_{13} and X_{14}). Each respective analysis was significant:

Table 4.10d

Univariate Follow-up of MANOVA Results for the Effect of C = Demand Conditions on D = Related & Supporting Industries (C → D)

D = Related and Supporting Industries					
X_7 = Safety and Security[a]					
C = Demand Conditions	***B***	***SE***	***t(134)***	***p***	**95% CI**
Intercept	4.26	0.75	5.67	< .0001***	[2.77, 5.74]
X_{13} = Prioritization of T&T	0.42	0.09	4.54	< .0001***	[0.23, 0.60]
X_{14} = Price Competitiveness	-0.19	0.11	-1.73	.0853	[-0.40, 0.03]
X_8 = International Openness[b]					
Intercept	1.66	0.62	2.69	.0081**	[0.44 2.89]
X_{13} = Prioritization of T&T	0.63	0.08	8.30	< .0001***	[0.48, 0.78]
X_{14} = Price Competitiveness	-0.26	0.09	-2.91	.0043**	[-0.44, -0.08]
X_9 = Air Transport Infrastructure[c]					
Intercept	1.14	0.86	1.34	.1836	[-0.55, 2.84]
X_{13} = Prioritization of T&T	0.75	0.10	7.14	< .0001***	[0.54, 0.95]
X_{14} = Price Competitiveness	-0.31	0.12	-2.46	.0153*	[-0.55, -0.06]
X_{10} = Ground and Port Infrastructure[d]					
Intercept	2.46	0.80	3.08	.0025**	[0.88, 4.04]
X_{13} = Prioritization of T&T	0.66	0.10	6.74	< .0001***	[0.46, 0.85]
X_{14} = Price Competitiveness	-0.40	0.12	-3.44	.0008**	[-0.63, -0.17]
X_{12} = Cultural Resources[e]					
Intercept	1.86	1.19	1.56	.1220	[-0.50, 4.22]
X_{13} = Prioritization of T&T	0.40	0.15	2.76	.0066**	[0.11, 0.69]
X_{14} = Price Competitiveness	-0.28	0.17	-1.59	.1149	[-0.62, 0.07]

Note. $N = 136$.
[a]$R^2 = .18$, $F(2, 133) = 14.73$, $p < .0001$. [b]$R^2 = .42$, $F(2, 133) = 47.74$, $p < .0001$. [c]$R^2 = .35$, $F(2, 133) = 35.11$, $p < .0001$. [d]$R^2 = .36$, $F(2, 133) = 36.75$, $p < .0001$. [e]$R^2 = .09$, $F(2, 133) = 6.58$, $p = .0019$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

- $R^2 = .18$, $F(2, 133) = 14.73$, $p < .0001$. Thus, the two Demand Conditions variables collectively explained 18% of the variance in Safety and Security scores.

- $R^2 = .42$, $F(2, 133) = 47.74$, $p < .0001$. Thus, the two Demand Conditions variables collectively explained 42% of the variance in International Openness scores.
- $R^2 = .35$, $F(2, 133) = 35.11$, $p < .0001$. Thus, the two Demand Conditions variables collectively explained 35% of the variance in Air Transport Infrastructure scores.
- $R^2 = .36$, $F(2, 133) = 36.75$, $p < .0001$. Thus, the two Demand Conditions variables collectively explained 36% of the variance in Ground and Port Infrastructure scores.
- $R^2 = .09$, $F(2, 133) = 6.58$, $p = .0019$. Thus, the two Demand Conditions variables collectively explained 9% of the variance in Cultural Resources scores.

With respect to the first model, only X_{13} = Prioritization of T&T was significant: When controlling for the effect of X_{14}, for every 1-unit increase in Prioritization of T&T scores, Safety and Security scores increased on average by 0.42 units, $B = 0.42$, $t(133) = 4.54$, $p < .0001$.

This finding indicates that as a country gives higher priority to regulations and policies relative to its travel and tourism industry, the average score for safety and security increases. In the context of the current study, this implies that by giving higher priority to international travel and tourism policies/conditions promotes an increase in that country's attention to safety and security conditions

such as business costs of crime, violence, and terrorism, homicide rates, and reliable police services.

With respect to the second model, both X_{13} = Prioritization of T&T and X_{14} = Price Competitiveness were significant: (a) When controlling for the effect of X_{14}, for every 1-unit increase in Prioritization of T&T scores, International Openness scores increased on average by 0.63 units, $B = 0.63$, $t(133) = 8.30$, $p < .0001$; and (b) when controlling for the effect of X_{13}, for every 1-unit increase in Price Competitiveness scores, International Openness scores decreased on average by 0.26 units, $B = -0.26$, $t(133) = -2.91$, $p = .0043$. These findings indicate that as a country's regulations and policies relative to prioritizing its travel and tourism industry improve, the average score for international openness increases. In the context of the current study, this implies that as countries increase their attention to regulations and policies relative to travel and tourism, they also give greater attention to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements. These findings also indicate that as a country becomes more price-competitive relative to the travel and tourism costs, the average score for international openness decreases. In other words, as a country becomes more competitive internationally with respect to ticket taxes and airport charges, hotel prices, purchasing power, and fuel prices, its international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements suffer.

With respect to the third model, both X_{13} = Prioritization of T&T and X_{14} = Price Competitiveness were significant: (a) When controlling for the effect of X_{14}, for every 1-unit increase in Prioritization of T&T scores, Air Transport Infrastructure scores increased on average by 0.75 units, $B = 0.75$, $t(133) = 7.14$, $p < .0001$; and (b) when controlling for the effect of X_{13}, for every 1-unit increase in Price Competitiveness scores, Air Transport Infrastructure scores decreased on average by 0.31 units, $B = -0.31$, $t(133) = -2.46$, $p = .0153$. These findings indicate that as a country's regulations and policies relative to prioritizing its travel and tourism industry improve, the average score for air transport infrastructure increases. In the context of the current study, this implies that increased prioritization to a country's travel and tourism industry by the government and institutions promotes an increase in its air transport infrastructure including airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international). These findings also suggest that as a country becomes more price-competitive relative to the travel and tourism costs, the average score for air transport infrastructure decreases. In other words, improvements to a country's price competitiveness results in a decline in that country's air transport infrastructure improvements.

With respect to the fourth model, both X_{13} = Prioritization of T&T and X_{14} = Price Competitiveness were significant: (a) When controlling for the effect of X_{14}, for every 1-unit increase in Prioritization of T&T scores, Ground and Port

Infrastructure scores increased on average by 0.66 units, $B = 0.6$, $t(133) = 6.74$, $p < .0001$; and (b) when controlling for the effect of X_{13}, for every 1-unit increase in Price Competitiveness scores, Ground and Port Infrastructure scores decreased on average by 0.40 units, $B = -0.40$, $t(133) = -3.44$, $p = .0008$. These findings indicate that as a country's regulations and policies relative to prioritizing its travel and tourism industry improve, the average score for ground and port infrastructure increases. In the context of the current study, this implies that increased prioritization to a country's travel and tourism industry by the government and institutions promotes an increase in its ground and port infrastructure including the quality of roads, road density, railroad and port infrastructure, and ground transport efficiency. These findings also suggest that as a country becomes more price-competitive relative to the travel and tourism costs, the average score for ground and port infrastructure decreases. In other words, improvements to a country's price competitiveness results in a decline that country's ground and port infrastructure improvements.

With respect to the fifth model, only X_{13} = Prioritization of T&T was significant: When controlling for the effect of X_{14}, for every 1-unit increase in Prioritization of T&T scores, Cultural Resources scores increased on average by 0.402 units, $B = 0.40$, $t(133) = 2.76$, $p < .0066$. These findings indicate that as a country's regulations and policies relative to prioritizing its travel and tourism industry improve, the average score for cultural resources and business travel

increases. In the context of the current study, this implies that increased prioritization to a country's travel and tourism industry by the government and institutions improves that country's cultural resources and business travel aspects such as sports stadiums, international conferences, and cultural/entertainment for tourism.

Dimension D's effect on dimensions A, B, and C: D→A, D→B, D→C. To examine the effect of D = Related and Supporting Industries on A = Factor Conditions (D → A), B = Firm Strategy, Structure, and Rivalry (D → B), and C = Demand Conditions (D → C), I conducted a multivariate analysis of variance (MANOVA) via multiple regression with the factors of A (X_1 and X_4), B (X_5 and X_6), and C (X_{13} and X_{14}) as the dependent variables, and the factors of D (X_7, X_8, X_9, X_{10}, and X_{12}) as the independent variables (see Figure 4.2). As reported in Table 4.11a the overall MANOVA model was significant, Wilks' $\Lambda = .06$, $p < .0001$, and the significance was with respect to all Related and Supporting Industries variables

Table 4.11a

MANOVA Summary of D = Related & Supporting Industries' Effect on: A = Factor Conditions (D → A); B = Firm Strategy, Structure, & Rivalry (D → B); and C = Demand Conditions (D → C)

D = Related and Supporting Industries	Eigenvalue	*F*	*df*	*p*
X_7 = Safety and Security	0.28	5.76	6, 125	< .0001***
X_8 = International Openness	0.52	10.94	6, 125	< .0001***
X_9 = Air Transport Infrastructure	0.41	8.48	6, 125	< .0001***
X_{10} = Ground and Port Infrastructure	0.55	11.36	6, 125	< .0001***
X_{12} = Cultural Resources and Business Travel	0.61	12.64	6, 125	< .0001***

Note. $N = 136$. Whole model Wilks $\Lambda = .06$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

(X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel). Consequently, I conducted six independent follow-up univariate *F* tests, one for each dependent variable.

The effect of dimension D on dimension A (D → A). As reported in Table 4.11b, two separate regression analyses were conducted. The first one involved regressing X_1 = Health and Hygiene on the five factors of Dimension D (X_7, X_8, X_9, X_{10}, and X_{12}), and the second one involved regressing X_4 = Natural Resources on X_7,

Table 4.11b

Univariate Follow-up of MANOVA Results for the Effect of D = Related and Supporting Industries on A = Factor Conditions (D → A)

A = Factor Conditions					
X_1 = Health and Hygiene[a]					
D = Related & Supporting Industries	***B***	***SE***	***t(130)***	***p***	**95% CI**
Intercept	1.58	0.49	3.20	.0017**	[0.60, 2.56]
X_7 = Safety and Security	0.24	0.11	2.25	.0264*	[0.03, 0.45]
X_8 = International Openness	0.19	0.12	1.65	.1012	[-0.04, 0.42]
X_9 = Air Transport Infrastructure	0.09	0.12	0.80	.4253	[-0.14, 0.33]
X_{10} = Ground & Port Infrastructure	0.35	0.12	2.89	.0045**	[0.11, 0.59]
X_{12} = Cultural Resources	0.09	0.08	1.10	.2721	[-0.07, 0.24]
X_4 = Natural Resources[b]					
Intercept	2.26	0.37	6.18	< .0001***	[1.53, 2.98]
X_7 = Safety and Security	-0.01	0.08	-0.09	.9307	[-0.16, 0.15]
X_8 = International Openness	0.45	0.09	5.27	< .0001***	[0.28, 0.62]
X_9 = Air Transport Infrastructure	0.25	0.09	2.86	.0049**	[0.08, 0.42]
X_{10} = Ground & Port Infrastructure	-0.57	0.09	-6.39	< .0001***	[-0.75, -0.40]
X_{12} = Cultural Resources	0.36	0.06	6.23	< .0001***	[0.25, 0.47]

Note. $N = 136$.
[a]$R^2 = .44$, $F(5, 130) = 20.28$, $p < .0001$. [b]$R^2 = .54$, $F(5, 130) = 29.97$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

X_8, X_9, X_{10}, and X_{12}. Both analyses were significant: $R^2 = .44$, $F(5, 130) = 20.28$, $p < .0001$; and $R^2 = .54$, $F(5, 130) = 29.97$, $p < .0001$. Thus, the five Related and Supporting Industries variables collectively explained 44% of the variance in Health and Hygiene scores, and they collectively explained 54% of the variance in Natural Resources scores.

Within the first model, only X_7 = Safety and Security and X_{10} = Ground and Port Infrastructure were significant. More specifically: When controlling for the effect of X_8 = International Openness, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Safety and Security scores, Health and Hygiene scores increased on average by 0.24 units, $B = 0.24$, $t(130) = 2.25$, $p = .0264$. Similarly, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Ground and Port Infrastructure scores, Health and Hygiene scores increased on average by 0.35 units, $B = 0.35$, $t(130) = 2.89$, $p = .0045$. These findings suggest that as a country's regulations and policies relative to safety and security and/or ground and port infrastructure improve, the average score of health and hygiene increases. In the context of the current study, this implies that as a country's safety and security issues and/or ground port infrastructure conditions improve, the country's health and hygiene conditions also improve. Thus, by giving attention to business costs of crime, violence, and

terrorism, homicide rates, reliable police services, quality of roads, road density, railroad and port infrastructure, and ground transport efficiency results in improved health and hygiene conditions.

Within the second model, all Related and Supporting Industries variables were significant except X_7 = Safety and Security. For International Openness, when controlling for the effect of X_7 = Safety and Security, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in International Openness scores, Natural Resources scores increased on average by 0.45 units, $B = 0.45$, $t(130) = 5.27$, $p < .0001$. This finding suggests that as a country's regulations and policies relative to international openness improve, the average score of natural resources increases. In context of the current study, this implies that improvements to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements results in increased attention to natural resources such as making natural assets more attractive and increased protection of natural areas.

For Air Transport Infrastructure, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Air Transport Infrastructure scores, Natural Resources scores increased on average by 0.25 units, $B = 0.25$, $t(130) = 2.86$, $p = .0049$. This finding indicates

that as a country's regulations and policies relative to air transport infrastructure improve, the average score of natural resources increases. In the context of the current study, this implies that increased attention to airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international) results in increased attention to natural resources such as making natural assets more attractive and increased protection of natural areas.

For Ground and Port Infrastructure, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Ground and Port Infrastructure scores, Natural Resources scores decreased on average by 0.57 units, $B = -0.57$, $t(130) = -6.39$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to ground and port infrastructure improve, the average score of natural resources decreases. In the context of the current study, this implies that by improving a country's quality of roads, road density, railroad and port infrastructure, and ground transport efficiency results in a decline in the attention given to that country's natural resources.

For Cultural Resources and Business Travel, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{10} = Ground and Port Infrastructure, for every 1-unit increase in Cultural Resources and Business Travel scores, Natural Resources scores increased on average by 0.36 units, $B = 0.36$, $t(130) = 6.23$, $p < .0001$. This finding

indicates that as a country's regulations and policies relative to cultural resources and business travel improve, the average score of natural resources increases. In the context of the current study, this implies that when increased attention is given to a country's cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment for tourism, this leads to an increase in the attention given to that country's natural resources.

The effect of dimension D on dimension B (D → B). As reported in Table 4.11c, two separate regression analyses were conducted. The first one involved

Table 4.11c

Univariate Follow-up of MANOVA Results for the Effect of D = Related & Supporting Industries on B = Firm Strategy, Structure, & Rivalry (D → B)

B = Firm Strategy, Structure, and Rivalry					
X_5 = Business Environment[a]					
D = Related & Supporting Industries	***B***	***SE***	***t(130)***	***p***	**95% CI**
Intercept	2.55	0.22	11.46	< .0001***	[2.11, 2.99]
X_7 = Safety and Security	0.15	0.05	3.19	.0018*	[0.06, 0.25]
X_8 = International Openness	-0.04	0.05	-0.77	.4398	[-0.14, 0.06]
X_9 = Air Transport Infrastructure	0.29	0.05	5.52	< .0001***	[0.19, 0.40]
X_{10} = Ground & Port Infrastructure	0.24	0.06	4.31	< .0001***	[0.13, 0.34]
X_{12} = Cultural Resources	-0.16	0.04	-4.56	< .0001***	[-0.23, -0.09]
X_6 = Environmental Sustainability[b]					
Intercept	2.43	0.24	10.13	< .0001***	[1.95, 2.90]
X_7 = Safety and Security	0.19	0.05	3.63	.0004**	[0.08, 0.29]
X_8 = International Openness	0.18	0.06	3.28	.0014**	[0.07, 0.29]
X_9 = Air Transport Infrastructure	-0.001	0.06	-0.02	.9848	[-0.11, 0.11]
X_{10} = Ground & Port Infrastructure	0.10	0.06	1.72	.0876	[-0.02, 0.22]
X_{12} = Cultural Resources	-0.07	0.04	-1.78	.0782	[-0.14, 0.01]

Note. $N = 136$.
[a]$R^2 = .63$, $F(5, 130) = 44.33$, $p < .0001$. [b]$R^2 = .37$, $F(5, 130) = 15.21$, $p < .0001$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

regressing X_5 = Business Environment on the five factors of Dimension D (X_7, X_8, X_9, X_{10}, and X_{12}), and the second one involved regressing X_6 = Environmental Sustainability on X_7, X_8, X_9, X_{10}, and X_{12}. Both analyses were significant: $R^2 = .63$, $F(5, 130) = 44.33$, $p < .0001$; and $R^2 = .37$, $F(5, 130) = 15.21$, $p < .0001$. Thus, the five Related and Supporting Industries variables collectively explained 63% of the variance in Business Environment scores, and they collectively explained 37% of the variance in Environmental Sustainability scores.

Within the first model, all Related and Supporting Industries variables were significant except X_8 = International Openness. More specifically: For Safety and Security, when controlling for the effect of X_8 = International Openness, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Safety and Security scores, Business Environment scores increased on average by 0.15 units, $B = 0.45$, $t(130) = 3.19$, $p = .0018$. This finding suggests that as a country's regulations and policies relative to safety and security improve, the average score of business environment increases. In context of the current study, this implies that increased attention to safety and security issues such as business costs of crime, violence, and terrorism, homicide rates, and reliable police services results in more efficient business environment regulations and policies. Some of these business regulations/polices include the time and cost to start a business, efficiency of legal framework in settling disputes and challenging regulations, and tax related issues.

For Air Transport Infrastructure, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Air Transport Infrastructure scores, Business Environment scores increased on average by 0.29 units, $B = 0.29$, $t(130) = 5.52$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to air transport infrastructure improve, the average score of business environment increases. In the context of the current study, this implies that increased attention to airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international) results in increased attention to business environment regulations and policies.

For Ground and Port Infrastructure, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Ground and Port Infrastructure scores, Business Environment scores increased on average by 0.24 units, $B = 0.24$, $t(130) = 4.31$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to ground infrastructure improve, the average score of business environment increases. In the context of the current study, this implies that by improving a country's quality of roads, road density, railroad and port infrastructure, and ground transport efficiency results in increased attention given to that country's business environment.

For Cultural Resources and Business Travel, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{10} = Ground and Port Infrastructure, for every 1-unit increase in Cultural Resources and Business Travel scores, Business Environment scores decreased on average by 0.16 units, B = -0.16, $t(130)$ = -4.56, $p < .0001$. This finding indicates that as a country's regulations and policies relative to Cultural Resources and Business Travel improve, the average score of business environment decreases. In the context of the current study, this implies that when increased attention is given to a country's cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment for tourism, this leads to a decrease in the attention given to that country's business environment.

Within the second model, only X_7 = Safety and Security and X_8 = International Openness were significant. For Safety and Security, when controlling for the effect of X_8 = International Openness, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Safety and Security scores, Environmental Sustainability scores increased on average by 0.19 units, B = 0.19, $t(130)$ = 3.63, p = .0004. This finding suggests that as a country's regulations and policies relative to safety and security improve, the average score of environmental sustainability increases. In context of the current study, this implies that increased attention to

safety and security issues such as business costs of crime, violence, and terrorism, homicide rates, and reliable police services results in increased attention to issues related to environmental sustainability. Examples include enforcement of environmental regulations, sustainability of travel and tourism industry development, and wastewater treatment.

For International Openness, when controlling for the effect of X_7 = Safety and Security, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in International Openness scores, Environmental Sustainability scores increased on average by 0.18 units, $B = 0.18$, $t(130) = 3.28$, $p = .0014$. This finding suggests that as a country's regulations and policies relative to international openness improve, the average score of environmental sustainability increases. In the context of the current study, this implies that increased attention to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements results in increased attention to environmental sustainability.

The effect of dimension D on dimension C (D → C). As reported in Table 4.11d, two separate regression analyses were conducted. The first one involved regressing X_{13} = Prioritization of T&T on the five factors of Dimension D (X_7, X_8, X_9, X_{10}, and X_{12}), and the second one involved regressing X_{14} = Price Competitiveness on X_7, X_8, X_9, X_{10}, and X_{12}. Both analyses were significant: R^2 =

Table 4.11d

Univariate Follow-up of MANOVA Results for the Effect of D = Related & Supporting Industries on C = Demand Conditions (D → C)

C = Demand Conditions X_{13} = Prioritization of T&T[a]					
D = Related & Supporting Industries	***B***	***SE***	***t(130)***	***p***	**95% CI**
Intercept	2.09	0.32	6.55	< .0001***	[1.46, 2.73]
X_7 = Safety and Security	0.10	0.07	1.54	.1271	[-0.03, 0.24]
X_8 = International Openness	0.38	0.07	5.16	< .0001***	[0.24, 0.53]
X_9 = Air Transport Infrastructure	0.24	0.08	3.16	.0019**	[0.09, 0.39]
X_{10} = Ground & Port Infrastructure	0.04	0.08	0.46	.6453	[-0.12, 0.19]
X_{12} = Cultural Resources	-0.10	0.05	-2.00	.0473*	[-0.20, -0.001]
X_{14} = Price Competitiveness[b]					
Intercept	5.99	0.34	17.46	< .0001***	[5.31, 6.67]
X_7 = Safety and Security	-0.04	0.07	-0.51	.6134	[-0.18, 0.11]
X_8 = International Openness	-0.14	0.08	-1.70	.0913	[-0.29, 0.02]
X_9 = Air Transport Infrastructure	-0.02	0.08	-0.29	.7756	[-0.18, 0.14]
X_{10} = Ground & Port Infrastructure	-0.13	0.08	-1.53	.1289	[-0.30, 0.04]
X_{12} = Cultural Resources	0.01	0.05	0.10	.9183	[-0.10, 0.11]

Note. $N = 136$.
[a]$R^2 = .49$, $F(5, 130) = 24.51$, $p < .0001$. [b]$R^2 = .16$, $F(5, 130) = 4.93$, $p = .0004$. See also Figure 4.2.
*$p < .05$. **$p < .01$. ***$p < .001$.

.49, $F(5, 130) = 24.51$, $p < .0001$; and $R^2 = .16$, $F(5, 130) = 4.93$, $p = .0004$. Thus, the five Related and Supporting Industries variables collectively explained 49% of the variance in Prioritization of T&T scores, and they collectively explained 16% of the variance in Price Competitiveness scores.

Within the first model X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{12} = Cultural Resources and Business Travel were significant. For International Openness, when controlling for the effect of X_7 = Safety and Security, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure,

and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in International Openness scores, Prioritization of T&T scores increased on average by 0.38 units, $B = 0.38$, $t(130) = 5.16$, $p < .0001$. This finding suggests that as a country's regulations and policies relative to international openness improve, the average score of prioritizations of T&T increases. In the context of the current study, this implies that increased attention to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements results in increased attention to travel and tourism regulations/policies such as government expenditure, marketing efforts, and branding strategy.

For Air Transport Infrastructure, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_{10} = Ground and Port Infrastructure, and X_{12} = Cultural Resources and Business Travel, for every 1-unit increase in Air Transport Infrastructure scores, Prioritization of T&T scores increased on average by 0.24 units, $B = 0.24$, $t(130) = 3.16$, $p = .0019$. This finding suggests that as a country's regulations and policies relative to air transport infrastructure improve, the average score of prioritizations of T&T increases. In the context of the current study, this implies that by improving a country's quality of roads, road density, railroad and port infrastructure, and ground transport efficiency results in increased attention to travel and tourism regulations/policies such as government expenditure, marketing efforts, and branding strategy.

For Cultural Resources and Business Travel, when controlling for the effect of X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, and X_{10} = Ground and Port Infrastructure, for every 1-unit increase in Cultural Resources and Business Travel scores, Prioritization of T&T scores decreased on average by 0.10 units, B = -0.10, $t(130)$ = -2.00, p = .0473. This finding suggests that as a country's regulations and policies relative to cultural resources improve, the average score of Prioritization of T&T decreases. In the context of the current study, this implies that when a country increases its attention to cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment for tourism, the country decreases its attention to T&T regulations/policies such as government expenditure, marketing efforts, and branding strategy.

Although the second model was significant, none of the Related and Supporting Industries variables was significant.

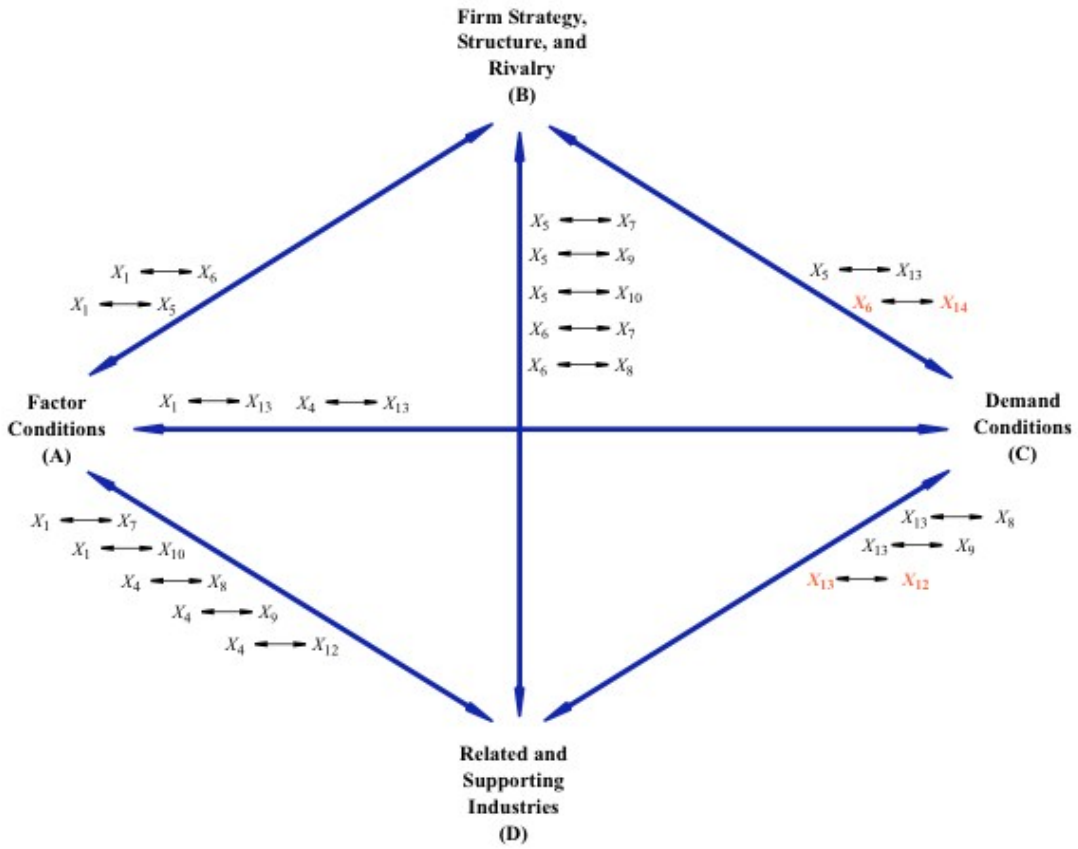
Summary of primary analysis 1. When examined from the perspective of Porter's (1998) Diamond model, statistical analyses involving the 2017 data for the TTCI factors yielded several statistically significant reciprocal relationships relative to the four dimensions of Porter's model. Tables 4.12–4.15 and Figure 4.3 summarize these significant relationships, and a brief discussion each follows. These relationships are discussed further in Chapter 5.

The influence of factor conditions. As illustrated in Figure 4.3 and summarized in Table 4.12, the Factor Conditions dimension, which had two significant TTCI factors—Health and Hygiene and Natural Resources—had a significant reciprocal relationship with various TTCI factors that comprised the other three dimensions:

(a) Relative to the Firm Strategy, Structure, and Rivalry dimension, the significant TTCI factors were Business Environment and Environmental Sustainability:
    - Increased attention to health and hygiene led to an increase in business environment, and vice versa.
    - Increased attention to health and hygiene also led to an increase in environmental sustainability, and vice versa.

(b) Relative to the Demand Conditions dimension, the only significant TTCI factor was Prioritization of Travel and Tourism:
    - Increased attention to health and hygiene led to an increase in prioritization of travel and tourism, and vice versa.
    - Increased attention to natural resources led to an increase in prioritization of travel and tourism, and vice versa.

(c) Relative to the Related and Supporting Industries dimension, the significant TTCI factors were Safety and Security, International Openness, Air Transport Infrastructure, Ground and Port Infrastructure, and Cultural Resources and Business Travel:



Legend

A = Factor Conditions
- X_1 = Health and Hygiene
- X_4 = Natural Resources

B = Firm Strategy, Structure, and Rivalry
- X_5 = Business Environment
- X_6 = Environmental Sustainability

C = Demand Conditions
- X_{13} = Prioritization of Travel and Tourism
- X_{14} = Price Competitiveness

D = Related and Supporting Industries
- X_7 = Safety and Security
- X_8 = International Openness
- X_9 = Air Transport Infrastructure
- X_{10} = Ground and Port Infrastructure
- X_{12} = Cultural Resources and Business Travel

Note: All relationships are positive except for the two-way relationship between X_6 and X_{14}, and the one-way relationship between X_{12} and X_{13}, which are negative.

Figure 4.3. **A summary of the significant reciprocal relationships among the TTCI factors relative to the four dimensions of Porter's (1998) diamond theory model.**

Table 4.12

Summary of Significant Reciprocal Relationships Relative to Porter's (1998) Diamond Theory Model and TTCI Factors for A = Factor Conditions

	B	*t* [a]	95% CI [b]	*r* [c]
A = Factor Conditions and B = Firm Strategy, Structure, & Rivalry (A → B) and (B → A)				
X_1 = Health and Hygiene → X_5 = Business Environment	0.20	4.55	[0.12, 0.29]	.37
X_5 = Business Environment → X_1 = Health and Hygiene	0.52	3.32	[0.21, 0.83]	
X_1 = Health and Hygiene → X_6 = Environmental Sustainability	0.14	3.76	[0.07, 0.22]	.31
X_6 = Environmental Sustainability → X_1 = Health and Hygiene	0.42	2.22	[0.05, 0.80]	
A = Factor Conditions and C = Demand Conditions (A → C) and (C → A)				
X_1 = Health and Hygiene → X_{13} = Prioritization of T&T	0.31	6.17	[0.21, 0.40]	.46
X_{13} = Prioritization of T&T → X_1 = Health and Hygiene	0.65	5.56	[0.42, 0.89]	
X_4 = Natural Resources → X_{13} = Prioritization of T&T	0.23	3.72	[0.11, 0.35]	.28
X_{13} = Prioritization of T&T → X_4 = Natural Resources	0.31	2.97	[0.10, 0.51]	
A = Factor Conditions and D = Related & Supporting Industries (A → D) and (D → A)				
X_1 = Health and Hygiene → X_7 = Safety and Security	0.34	5.73	[0.22, 0.46]	.44
X_7 = Safety and Security → X_1 = Health and Hygiene	0.24	2.25	[0.03, 0.45]	
X_1 = Health and Hygiene → X_{10} = Ground & Port Infrastructure	0.57	9.12	[0.44, 0.69]	.62
X_{10} = Ground & Port Infrastructure → X_1 = Health & Hygiene	0.35	2.89	[0.11, 0.59]	
X_4 = Natural Resources → X_8 = International Openness	0.37	5.95	[0.24, 0.49]	.40
X_8 = International Openness → X_4 = Natural Resources	0.45	5.27	[0.28, 0.62]	
X_4 = Natural Resources → X_9 = Air Transport Infrastructure	0.46	5.94	[0.31, 0.61]	.39
X_9 = Air Transport Infrastructure → X_4 = Natural Resources	0.25	2.86	[0.08, 0.42]	
X_4 = Natural Resources → X_{12} = Cultural Resources	0.81	9.12	[0.63, 0.99]	.58
X_{12} = Cultural Resources → X_4 = Natural Resources	0.36	6.23	[0.25, 0.47]	

Note. $N = 136$.

[a] t is significant for $\alpha = .05$ and correspond to B. [b] 95% CIs correspond to B. [c] r = zero-order correlations.

- Increased attention to health and hygiene led to an increase in safety and security, and vice versa.
- Increased attention to health and hygiene led to an increase in ground and port infrastructure, and vice versa.

- Increased attention to natural resources led to an increase in international openness, and vice versa.
- Increased attention to natural resources led to an increase in air transport infrastructure, and vice versa.
- Increased attention to natural resources led to an increase in cultural resources and business travel, and vice versa.

The influence of firm strategy, structure, and rivalry. As illustrated in Figure 4.3 and summarized in Table 4.13, the Firm Strategy, Structure, and Rivalry dimension, which had two significant TTCI factors—Business Environment and Environmental Sustainability—had a significant reciprocal relationship with various TTCI factors that comprised the other three dimensions. (*Note.* The reciprocal relationship with the Factor Conditions dimension was presented earlier).

(a) Relative to the Demand Conditions dimension, the significant TTCI factors were Prioritization of Travel and Tourism and Price Competitiveness:
   - Increased attention to business environment led to an increase in prioritization of travel and tourism, and vice versa.
   - Increased attention to environmental sustainability led to a decrease in price competitiveness, and vice versa.

(b) Relative to the Related and Supporting Industries dimension, the significant TTCI factors were Safety and Security, International Openness, Air Transport Infrastructure, and Ground and Port Infrastructure:

Table 4.13

Summary of Significant Reciprocal Relationships Relative to Porter's (1998) Diamond Theory Model and TTCI Factors for B = Firm Strategy, Structure, & Rivalry

	B	*t*[a]	95% CI[b]	*r*[c]
B = Firm Strategy, Structure, & Rivalry and C = Demand Conditions (B → C) and (C → B)				
X_5 = Business Environment → X_{13} = Prioritization of T&T	0.59	6.00	[0.40, 0.79]	.52
X_{13} = Prioritization of T&T → X_5 = Business Environment	0.40	6.42	[0.28, 0.52]	
X_6 = Environmental Sustainability → X_{14} = Price Competit.	-0.61	-5.97	[-0.81, -0.41]	-.51
X_{14} = Price Competitiveness → X_6 = Environment Sustain.	-0.38	-6.13	[-0.50, -0.25]	
B = Firm Strategy, Structure, & Rivalry and D = Related & Supporting Industries (B → D) and (D → B)				
X_5 = Business Environment → X_7 = Safety and Security	0.61	6.14	[0.42, 0.81]	.58
X_7 = Safety and Security → X_5 = Business Environment	0.15	3.19	[0.06, 0.25]	
X_5 = Business Environment → X_9 = Air Transport Infrastru.	1.05	8.19	[0.80, 1.30]	.63
X_9 = Air Transport Infrastructure → X_5 = Business Environ.	0.29	5.52	[0.19, 0.40]	
X_5 = Business Environment → X_{10} = Ground/Port Infrastru.	0.98	8.94	[0.76, 1.10]	.69
X_{10} = Ground & Port Infrastructure → X_5 = Business Env.	0.24	4.31	[0.13, 0.34]	
X_6 = Environmental Sustain. → X_7 = Safety and Security	0.53	4.34	[0.29, 0.77]	.50
X_7 = Safety and Security → X_6 = Environ. Sustain.	0.19	3.63	[0.08, 0.29]	
X_6 = Environment. Sustain. → X_8 = International Openness	0.56	4.17	[0.29, 0.82]	.45
X_8 = International Openness → X_6 = Environ. Sustain.	0.18	3.28	[0.07, 0.29]	

Note. N = 136. See Table 4.12 for significant reciprocal relationships between B = Firm Strategy, Structure, and Rivalry and A = Factor Conditions (B → A and A → B).
[a]t is significant for α = .05 and correspond to B. [b]95% CIs correspond to B. [c]r = zero-order correlations.

- Increased attention to business environment led to an increase in safety and security, and vice versa.
- Increased attention to business environment led to an increase in air transport infrastructure, and vice versa.
- Increased attention to business environment led to an increase in ground and port infrastructure, and vice versa.

- Increased attention to environmental sustainability led to an increase in safety and security, and vice versa.
- Increased attention to environmental sustainability led to an increase in international openness and vice versa.

The influence of demand conditions. As illustrated in Figure 4.3 and summarized in Table 4.14, the Demand Conditions dimension, which had two significant TTCI factors—Prioritization of Travel and Tourism and Price Competitiveness—had a significant reciprocal relationship with various TTCI factors that comprised the other three dimensions. (*Note.* The reciprocal relationships with the Factor Conditions dimension and the Firm Strategy, Structure, and Rivalry dimension were presented earlier). Relative to the Related

Table 4.14

Summary of Significant Reciprocal Relationships Relative to Porter's (1998) Diamond Theory Model and TTCI Factors for C = Demand Conditions

C = Demand Conditions and D = Related & Supporting Industries (C → D) and (D → C)				
	B	***t*** [a]	**95% CI** [b]	***r*** [c]
X_{13} = Prioritization of T&T → X_8 = International Openness	0.63	8.30	[0.48, 0.78]	.62
X_8 = International Openness → X_{13} = Prioritization of T&T	0.38	5.16	[0.24, 0.53]	
X_{13} = Prioritization of T&T → X_9 = Air Transport Infrastru.	0.75	7.14	[0.54, 0.95]	.56
X_9 = Air Transport Infrastru. → X_{13} = Prioritization of T&T	0.24	3.16	[0.09. 0.39]	
X_{13} = Prioritization of T&T → X_{12} = Cultural Resources	0.40	2.76	[0.11, 0.69]	.27
X_{12} = Cultural Resources → X_{13} = Prioritization of T&T	-0.10	-2.00	[-0.20, -0.001]	

Note. N = 136. See Table 4.12 for significant reciprocal relationships between C = Demand Conditions and A = Factor Conditions (C → A and A → C), and see Table 4.13 for significant reciprocal relationships between C = Demand Conditions and B = Firm Strategy, Structure, and Rivalry (C → B and B → C).
[a]t is significant for α = .05 and correspond to B. [b]95% CIs correspond to B. [c]r = zero-order correlations.

and Supporting Industries dimension, the significant TTCI factor International Openness, Air Transport Infrastructure, and Cultural Resources and Business Travel:

- Increased attention to prioritization of travel and tourism led to an increase in international openness, and vice versa.
- Increased attention to prioritization of travel and tourism led to an increase in air transport infrastructure, and vice versa.
- Increased attention to prioritization of travel and tourism led to a decrease in cultural resources and business travel, and vice versa.

The influence of related and supporting industries. The significant reciprocal relationships of the TTCI factors in the Related and Supporting Industries dimension with the factors in the other three dimensions were presented in the previous sections (see Figure 4.3 and Table 4.15). The reader also is directed to Tables 4.12, 4.13, and 4.14 for specific details.

Table 4.15

Summary of Significant Reciprocal Relationships Relative to Porter's (1998) Diamond Theory Model and TTCI Factors for D = Related & Supporting Industries

D = Related & Supporting Industries and A = Factor Conditions (D → A) and (A → D)	See Table 4.12
D = Related & Supporting Industries and B = Firm Strategy, Structure, & Rivalry (D → B) and (B → D)	See Table 4.13
D = Related & Supporting Industries and C = Demand Conditions (D → C) and (C → D)	See Table 4.14

Primary analysis 2: Examining the relationships between TTCI factors and PCAAWASK. To analyze the data relative to Research Question 2, I conducted a simultaneous multiple regression in which the dependent variable, Base 10 Log Y = Per Capita Annual Average of Weekly Available Seat Kilometers (PCAAWASK), was regressed on the targeted eight Travel and Tourism Competitive Index (TTCI) factors: X_1 = Health and Hygiene, X_5 = Business Environment, X_6 = Environmental Sustainability, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, X_{12} = Cultural Resources and Business Travel, X_{13} = Prioritization of Travel and Tourism, and X_{14} = Price Competitiveness. As reported in Table 4.16, the overall result of the simultaneous regression analysis was significant, $R^2 = .84$, $F(8, 127) = 84.10$, $p < .0001$. The eight factors collectively explained 84% of the variance in PCAAWASK scores. Furthermore, all the factors in the model also were significant except two, namely, X_5 = Business Environment and X_{10} = Ground and Port Infrastructure. A brief summary of each significant factor follows.

X_1 = Health & hygiene. The health and hygiene factor had a significant positive relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in a country's Health and Hygiene score, the median PCAAWASK increased by .19 units, $B = 0.19$, $t(127) = 6.84$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to Health and Hygiene conditions improve, the median per capita airline flights passenger

Table 4.16

Summary of Simultaneous Regression Relative to Log Base 10 of PCAAWASK As the DV

Term	B_i	SE_i	$t(127)_i$	p	95% CI
Intercept	-0.14	0.42	-0.34	.7361	[-0.983, 0.6964]
X_1 = Health & Hygiene	0.19	0.03	6.84	.0001***	[0.1361, 0.2468]
X_5 = Business Environment	0.08	0.06	1.33	.1870	[-0.04, 0.2014]
X_6 = Environmental Sustainability	-0.23	0.06	-3.87	.0002***	[-0.34, -0.11]
X_9 = Air Transport Infrastructure	0.40	0.04	9.32	.0001***	[0.3119, 0.4801]
X_{10} = Ground & Port Infrastructure	0.08	0.04	1.91	.0583	[-0.003, 0.1667]
X_{12} = Cultural Resources & Business Travel	-0.20	0.03	-5.94	.0001***	[-0.212, -0.106]
X_{13} = Prioritization of T&T	0.10	0.04	2.37	.0191*	[0.0157, 0.173]
X_{14} = Price Competitiveness	-0.12	0.04	-2.70	.0079**	[-0.206, -0.032]

Note. $N = 136$. The analysis was performed using simultaneous multiple regression. Final model results: $R^2 = .84$, $F(8, 127) = 84.10$, $p < .0001$. PCAAWASK = Per capita annual average of weekly available seat kilometers, which is a measure of airline seat capacity. This table is relative to Research Question 2.
*$p < .05$. **$p < .01$. ***$p < .001$.

capacity increases. More concretely, improvements to a country's health and hygiene conditions increase the country's airline seat capacity per week per capita.

X_5 = Business Environment. Business Environment did not have a significant relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in Business Environment, the median PCAAWASK only increased by .08 units, $B = 0.08$, $t(127) = 1.33$, $p = .1870$.

X_6 = Environment sustainability. The environment sustainability factor had a significant negative relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in a country's Environmental Sustainability score, the median PCAAWASK decreased by .23 units, $B = -0.23$, $t(127) = -3.87$, $p = .0002$. This finding indicates that as a country's regulations and policies relative to environmental sustainability improve, the median per capita airline flights

passenger capacity increases. More concretely, a country's increased attention to sustaining its climate/environment results in a decline in the country's airline seat capacity per week per capita.

X_9 = Air Transport Infrastructure. The Air Transport Infrastructure factor had a significant positive relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in a country's Air Transport Infrastructure score, the median PCAAWASK increased by .40 units, $B = 0.40$, $t(127) = 9.32$, $p < .0001$. This finding indicates that as a country's regulations and policies relative to Air Transport Infrastructure conditions improve, the median per capita airline flights passenger capacity increases. In other words, improvements to a country's Air Transport Infrastructure increase the country's airline seat capacity per week per capita.

X_{10} = Ground Port Infrastructure. Ground Port Infrastructure did not have a significant relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in Ground Port Infrastructure, the median PCAAWASK only increased by .08 units, $B = 0.08$, $t(127) = 1.91$, $p = .0583$.

X_{12} = Cultural Resources and Business Travel. Cultural Resources and Business Travel had a significant negative relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in Cultural Resources and Business Travel, the median PCAAWASK decreased by .20 units, $B = -0.20$, $t(127) = -5.94$, $p < .0001$. This finding indicates that, as countries' regulations and

policies improved to develop and maintain the elements of their Cultural Resources, the per capita airline flights passenger capacity decreased. More concretely, improvements to a country's components of its Cultural Resources and Business Travel decrease the country's airline seat capacity per week per capita.

X_{13} = Prioritization of T & T. Prioritization of T&T had a significant positive relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in Health and Hygiene, the median PCAAWASK increased by .10 units, $B = 0.10$, $t(127) = 2.37$, $p = .0191$. This finding indicates that as a country's regulations and policies relative to Prioritization of T&T conditions improve, the median per capita airline flights passenger capacity increases. That is, prioritization to a country's travel and tourism industry by the government and institutions increase the country's airline seat capacity per week per capita.

X_{14} = Price Competitiveness. Price Competitiveness had a significant negative relationship with PCAAWASK. Holding all other variables constant, for each 1-unit increase in Price Competitiveness, the median PCAAWASK decreased by .12 units, $B = -0.12$, $t(127) = -2.70$, $p = .0079$. This finding indicates that as a country becomes more cost-competitive relative to the travel and tourism costs, the per capita airline flights passenger capacity decreased. In other words, improvements to a country's Price Competitiveness decrease the country's airline seat capacity per week per capita.

Results of Hypotheses Testing

The research questions and the corresponding research hypotheses of the current study were stated in Chapter 1. These research hypotheses are restated here in null form for testing purposes. The decision to reject or fail to reject a null hypothesis and a discussion of the decisions made with respect to each follows.

Null hypothesis 1a: There will be no significant reciprocal relationship between any of the TTCI factors in the factor conditions dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Firm strategy, structure, and rivalry; demand conditions; and related and supporting industries. As illustrated in Figure 4.3 and summarized in Table 4.12, at least one of the two significant TTCI factors in the Factor Conditions dimension in Porter's (1998) model—X_1 = Health and Hygiene and X_4 = Natural Resources—had a significant reciprocal relationship with at least one TTCI factor in each of the other three dimensions. Therefore, Hypothesis 1a was rejected.

Null hypothesis 1b: There will be no significant reciprocal relationship between any of the TTCI factors in the firm strategy, structure, and rivalry dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Factor conditions, demand conditions, and related and supporting industries. As illustrated in Figure 4.3 and summarized in Tables 4.12 and 4.13, at least one of the two significant TTCI factors in the Firm Strategy, Structure, and Rivalry dimension in Porter's (1998) model—X_5 = Business Environment and X_6 =

Environmental Sustainability—had a significant reciprocal relationship with at least one TTCI factor in each of the other three dimensions. Therefore, Hypothesis 1b was rejected.

Null hypothesis 1c: There will be no significant reciprocal relationship between any of the TTCI factors in the Demand Conditions dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Factor conditions; firm strategy, structure, and rivalry; and related and supporting industries. As illustrated in Figure 4.3 and summarized in Tables 4.12, 4.13, and 4.14, at least one of the two significant TTCI factors in the Factor Conditions dimension in Porter's (1998) model—X_{13} = Prioritization of T&T and X_{14} = Price Competitiveness—had a significant reciprocal relationship with at least one TTCI factor in each of the other three dimensions. Therefore, Hypothesis 1c was rejected.

Null hypothesis 1d: There will be no significant reciprocal relationship between any of the TTCI factors in the Related and Supporting Industries dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Factor conditions; firm strategy, structure, and rivalry; and demand conditions. As illustrated in Figure 4.3 and summarized in Table 4.15, at least one of the five significant TTCI factors in the Factor Conditions dimension in Porter's (1998) model—X_7 = Safety and Security, X_8 = International Openness, X_9 = Air Transport Infrastructure, X_{10} = Ground and Port Infrastructure, and X_{12} =

Cultural Resources and Business Travel—had a significant reciprocal relationship with at least one TTCI factor in each of the other three dimensions. Therefore, Hypothesis 1d was rejected.

Null hypothesis 2: When examined from a simultaneous regression perspective, there will be no significant relationship between the TTCI factors and the per capita annual average of weekly available seat kilometers (PCAAWASK). As reported in Table 4.16, the overall regression model involving eight TTCI factors was significant, $R^2 = .84$, $F(8, 127) = 84.10$, $p < .0001$. Furthermore, six of these factors had a significant relationship with PCAAWASK: X_1 = Health and Hygiene ($B_1 = 0.19$, $t = 6.84$, $p < .0001$), X_6 = Environmental Sustainability ($B_6 = -0.23$, $t = -3.87$, $p = .0002$), X_9 = Air Transport Infrastructure ($B_9 = 0.40$, $t = 9.32$, $p < .0001$), X_{12} = Cultural Resources and Business Travel ($B_{12} = -0.20$, $t = -5.94$, $p < .0001$), X_{13} = Prioritization of T&T ($B_{13} = 0.10$, $t = 2.37$, $p = .0191$), and X_{14} = Price Competitiveness ($B_{14} = -0.12$, $t = -2.70$, $p = .0079$). Therefore, Hypothesis 2 was rejected.

Chapter 5

Conclusion, Implications, and Recommendations

Summary of Study

The purpose of the current study was two-fold: (a) to determine the extent to which the four dimensions of Porter's (1998) theoretical diamond model of international competitiveness can be applied to the travel and tourism (T&T) industry, and (b) to examine the relationship between the factors that contributed to a country's international competitiveness in the T&T industry and the per capita passenger capacity of the combined domestic and international airline flights originating within that country. With respect to Part (a), the reader is directed to Figure 1.1 in Chapter 1 for a graphical representation of Porter's model, and to Figure 4.2 in Chapter 4 for a graphical representation of how the TTCI factors were applied to Porter's model.

Data for the TTCI factors in Part (a) were acquired from the 2017 edition of the Travel and Tourism Competitiveness Report (World Economic Forum, 2017a), and these data were used to measure the factors within the four dimensions of Porter's (1998) model. Data for the per capita passenger capacity in Part (b) were based on Available Seat Kilometers (ASK) provided by the airlines. The weekly sum of ASK for all flights originating in a particular country, both domestic and international combined, taken by all airlines, was calculated for each week of the year and then averaged, resulting in that country's Annual Average of Weekly

Available Seat Kilometers (AAWASK). AAWASK data were acquired from (IATA, 2015) and based on 2015 figures. Because of disparate population sizes among countries, I divided AAWASK for each country in a given year by the country's population in that year, resulting in the per capita annual average of weekly available seat kilometers (PCAAWASK).

The current study used an explanatory correlational design for both Parts (a) and (b). This design was appropriate because the study involved a single group (countries of the world) and multiple measures pertinent to this group, and involved no manipulation. In quantitative terms, this design helps examine both the nature and the degree of the relationship between/among variables. The target population consisted of all the countries in the world, which, according to the total countries recognized by the U.S State Department was $N = 195$. The accessible population was all the countries to which TTCI scores were assigned and which had corresponding PCAAWASK data. The size of the accessible population, which also served as the current study's sample, was $N = 136$, and represented 70% of the countries in the world and encompassed 98% of world GDP (World Economic Forum, 2017b, p. 8).

As inferred above, the current study did not employ any formal data collection instruments. Instead, all study data—both TTCI factor scores and PCAAWASK data—consisted of archived data stored in publicly accessible databases. As a result, I had no control over the data collection instruments used to

collect these data, including whatever attention might have been given to instrumentation validity and reliability as well as what was done to maintain data integrity. However, because numerous organizations and governments around the world use these data to make decisions, I presumed that the instruments were valid and reliable, and that data integrity was maintained.

Two different statistical strategies were used to test the current study's hypotheses. In Part (a), multivariate analysis of variance (MANOVA) was used to examine the relationships involving the four dimensions of Porter's (1998) model. In Part (b), multiple regression was used to examine the relationships between the TTCI factors and PCAAWASK.

Summary of Findings

As noted above, the current study's sample was a census of its accessible population and involved data from $N = 136$ countries that were analyzed using two different statistical strategies: MANOVA for Part (a) and multiple regression for Part (b). Prior to performing these statistical analyses, the dataset underwent several preliminary data screening measures, including outliers and missing data analyses, and checking to confirm that the data were compliant with MANOVA and multiple regression assumptions. A brief summary of the findings and the results of the corresponding hypothesis tests on those findings are summarized in Table 5.1.

Primary analysis 1: Testing Porter's (1998) model. The first primary analysis was relative to RQ 1 and involved examining the reciprocal relationships

Table 5.1

Summary of the Results of Hypothesis Testing

Null Hypothesis		Decision
H_{1a}:	There will be no significant reciprocal relationship between any of the TTCI factors in the factor conditions dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Firm Strategy, Structure, and Rivalry; Demand Conditions; and Related and Supporting Industries.	Rejected
H_{1b}:	There will be no significant reciprocal relationship between any of the TTCI factors in the Firm Strategy, Structure, and Rivalry dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Factor Conditions, Demand conditions, and Related and Supporting Industries.	Rejected
H_{1c}:	There will be no significant reciprocal relationship between any of the TTCI factors in the Demand Conditions dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Factor Conditions; Firm Strategy, Structure, and Rivalry; and Related and Supporting Industries.	Rejected
H_{1d}:	There will be no significant reciprocal relationship between any of the TTCI factors in the Related and Supporting Industries dimension in Porter's (1998) model with any of the TTCI factors in the other dimensions: Factor Conditions; Firm Strategy, Structure, and Rivalry, and rivalry; and Demand Conditions.	Rejected
H_2:	When examined from a simultaneous regression perspective, there will be no significant relationship between the TTCI factors and the per capita annual average of weekly available seat kilometers (PCAAWASK).	Rejected

Note. $N = 136$.

of the TTCI factors relative to the four dimensions of Porter's model. To facilitate the following summary of findings, the reader is directed to Figure 4.3 in Chapter 4, which contains a graphical representation of the significant reciprocal relationships among the TTCI factors aligned to Porter's model.

The factor conditions dimension. Porter's (1998) Factor Conditions dimension consisted of two TTCI factors—Health and Hygiene and Natural Resources—and these two factors had significant reciprocal relationships with TTCI factors across the other three dimensions of Porter's model. A brief summary of each significant relationship follows.

Factor conditions ↔ Firm strategy, structure, and rivalry. The Factor Conditions dimension had a reciprocal relationship with the Firm Strategy, Structure, and Rivalry dimension as follows:

- There was a significant, positive relationship between Health and Hygiene and Business Environment.
- There was a significant, positive relationship between Health and Hygiene and Environmental Sustainability.

Factor conditions ↔ Demand conditions. The Factor Conditions dimension had a reciprocal relationship with the Demand Conditions dimension as follows:

- There was a significant, positive relationship between Health and Hygiene and Prioritization of T&T.
- There was a significant, positive relationship between Natural Resources and Prioritization of T&T.

Factor conditions ↔ Related and supporting industries. The Factor Conditions dimension had a reciprocal relationship with the Related and Supporting Industries dimension as follows:

- There was a significant, positive relationship between Health and Hygiene and Safety and Security.
- There was a significant, positive relationship between Health and Hygiene and Ground and Port Infrastructure.

- There was a significant, positive relationship between Natural Resources and International Openness.
- There was a significant, positive relationship between Natural Resources and Air Transport Infrastructure.
- There was a significant, positive relationship between Natural Resources and Cultural Resources and Business Travel.

The firm strategy, structure, and rivalry dimension. Porter's (1998) Firm Strategy, Structure, and Rivalry dimension consisted of two TTCI factors—Business Environment and Environmental Sustainability—and these two factors had significant reciprocal relationships with TTCI factors across the other three dimensions of Porter's model. A brief summary of each significant relationship follows. The reader will note that the reciprocal relationship between the Firm Strategy, Structure, and Rivalry dimension and the Factor Conditions dimension was presented in the previous section and is not repeated here.

Firm strategy, structure, and rivalry ↔ Factor conditions. See the previous discussion under Factor Conditions dimension.

Firm strategy, structure, and rivalry ↔ Demand conditions. The Firm Strategy, Structure, and Rivalry dimension had a reciprocal relationship with the Demand Conditions dimension as follows:

- There was a significant, positive relationship between Business Environment and Prioritization of T&T.

- There was a significant, negative relationship between Environmental Sustainability and Price Competitiveness.

Firm strategy, structure, and rivalry ↔ Related and supporting industries. The Firm Strategy, Structure, and Rivalry dimension had a reciprocal relationship with the Related and Supporting Industries dimension as follows:

- There was a significant, positive relationship between Business Environment and Safety and Security.
- There was a significant, positive relationship between Business Environment and Air Transport Infrastructure.
- There was a significant, positive relationship between Business Environment and Ground and Port Infrastructure.
- There was a significant, positive relationship between Environmental Sustainability and Safety and Security.
- There was a significant, positive relationship between Environmental Sustainability and International Openness.

The demand conditions dimension. Porter's (1998) Demand Conditions dimension consisted of two TTCI factors—Prioritization of T&T and Price Competitiveness—but only the former had significant reciprocal relationships with TTCI factors across the other three dimensions of Porter's model. A brief summary of each significant relationship follows. The reader will note that the reciprocal relationship between Demand Conditions and Factor Conditions was presented

earlier and is not repeated here. Similarly, the reciprocal relationship between Demand Conditions and Firm, Strategy, Structure, and Rivalry was presented earlier and is not repeated here.

Demand conditions ↔ Factor conditions. See the previous discussion under Factor Conditions dimension.

Demand conditions ↔ Firm, strategy, structure, and rivalry. See the previous discussion under Firm, Strategy, Structure, and Rivalry dimension.

Demand conditions ↔ Related and supporting industries. The Demand Conditions dimension had a reciprocal relationship with the Related and Supporting Industries dimension as follows:

- There was a significant, positive relationship between Prioritization of T&T and International Openness.
- There was a significant, positive relationship between Prioritization of T&T and Air Transport Infrastructure.
- There was a significant, negative relationship between Prioritization of T&T and Cultural Resources and Business Travel.

The related and supporting industries dimension. Porter's (1998) Related and Supporting Industries dimension consisted of five TTCI factors— Safety and Security, International Openness, Air Transport Infrastructure, Ground and Port Infrastructure, and Cultural Resources and Business Travel. These five factors also had significant reciprocal relationships with TTCI factors across the other three

dimensions of Porter's model. The reader is directed to the previous discussions related to the other three dimensions for a summary of these relationships.

Primary analysis 2: Examining the relationships between TTCI factors and PCAAWASK. The second analysis involved regressing the per capita annual average of weekly available seat kilometers (PCAAWASK) scores on the TTCI factors simultaneously. As discussed in Chapter 4, the PCAAWASK scores were highly skewed right and therefore were transformed to Log base 10 to satisfy the multivariate linearity and normality assumptions of regression. As a result, the corresponding interpretations apply to the median of the untransformed data. As also noted in Chapter 4, of the 14 TTCI factors, 6 were not included in this analysis because they were not correctly specified, which means they had no relationship with the DV once the corresponding relationships with all the other variables were removed. These factors were ICT Readiness, Tourist Services Infrastructure, Human Resources and Labor Market, Natural Resources, Safety and Security, and International Openness.

The overall result of the simultaneous multiple regression analysis yielded a significant model that explained 84% of the variance in the PCAAWASK scores. Furthermore, six of the eight TTCI factors were significant:

- Health and Hygiene, Air Transport Infrastructure, and Prioritization of T&T each had a significant positive relationship with PCAAWASK. As countries improved their health and hygiene services, increased attention

to their air transport infrastructure, and gave greater priority to travel and tourism, their PCAAWASK increased significantly.

- Environmental Sustainability, Cultural Resources and Business Travel, and Price Competitiveness each had a significant negative relationship with PCAAWASK. As countries increased their efforts toward sustaining the environment, increased their cultural resources and made business travel more attractive, and became more price-competitive with the rest of the world, their PCAAWASK decreased significantly.

The two TTCI factors that had no significant relationship with PCAAWASK were Business Environment and Ground and Port Infrastructure. Although these two factors were positively related to PCAAWASK, the respective relationships were not statistically significant. It is worth noting, though, that these factors' corresponding 95% confidence intervals were relatively narrow, so although the factors were not significant, they did provide relatively high accuracy in parameter estimation. It also is worth noting that the Ground and Port Infrastructure factor was significant for $\alpha = .06$, but it was not significant at the preset alpha level of $\alpha = .05$.

Conclusions and Inferences

This section contains a review of the study's findings relative to each research question as presented in Chapter 1. A separate discussion for each research

question is provided and includes a summary of the findings as well as corresponding inferences and plausible explanations for the results.

Research question 1. What is the relationship between the travel and tourism competitiveness index data for the countries of the world and Porter's (1998) diamond model of international competitiveness? As illustrated in Figure 4.2 in Chapter 4, Porter's model consists of four dimensions: (a) Factor Conditions; (b) Firm Strategy, Structure, and Rivalry; (c) Demand Conditions; and (d) Related and Supporting Industries. To answer RQ 1, each dimension was examined for its influence on the other three dimensions relative to each dimension's corresponding TTCI factors. A discussion of each dimension's influence on the other dimensions follows. (*Note:* Only significant *reciprocal* relationships are presented here because these were relevant to Porter's model. The reader is directed to Chapter 4 for a detailed presentation of *all* significant relationships, including one-way as well as reciprocal.)

Factor conditions. As summarized in Table 4.12 and illustrated in Figure 4.3 in Chapter 4, the Factor Conditions dimension, which consisted of the TTCI factors Health and Hygiene and Natural Resources, had a significant influence on the Firm Strategy, Structure, and Rivalry dimension, the Demand Conditions dimension, and the Related and Supporting Industries dimension.

Influences on firm strategy, structure, and rivalry. With respect to the Factor Conditions dimension's influence on the Firm Strategy, Structure, and

Rivalry dimension, Health and Hygiene had a significant positive relationship with both Business Environment and Environmental Sustainability. This implies that as a country's regulations and policies relative to health and hygiene improve, both the country's regulations and policies relative to business environment and environmental sustainability also improve. In other words, improvements to a country's health and hygiene conditions resulted in that country's better, improved, and more efficient business environment regulations and policies as well as an increased attention to sustaining its environment. A plausible explanation for these findings is that tourism activity considerably increases the demand for local water and sanitation infrastructure utilities, putting a pressure on their sustainable use and development. Thus, when a country increases its attention to improving the quality and level of its water supply and sanitation, this will reinforce positive regulations and policies for the sustainability of travel and tourism industry development, which is a component of environmental sustainability, and for the local economic growth and business environment as well. This is consistent with Frone and Frone (2013) who reported a reciprocal reinforcing relationship between the development of water and wastewater infrastructure in a country and the development of tourism as well as the prosperity of the business environment.

Another plausible explanation for these findings is that the prevalence of a deadly disease in a particular region/country could be the root cause of many negative effects such as threatened species and a weakening economy. For

example, Azémar and Desbordes (2009) reported that at a 1% increase in HIV prevalence in the adult population resulted in less net foreign direct investment (FDI) inflow of 3.5%. Similarly, Asiedu and Kanyama (2015) found that HIV/AIDS had a negative but diminishing effect on FDI, and this adverse effect occurred even when the HIV prevalence rate was as low as 0.1%. Therefore, it is reasonable to say that the rarity of diseases or availability of excellent medical disease/infection control and prevention practices in a country could naturally lead to increased prosperity of the business environment of that country, such as by attracting foreign direct investment. According to Azémar and Desbordes (2010), in the absence of HIV and malaria net FDI inflows in the median-GDP Sub Saharan African country could have been one-third higher during 2000–2004, with slightly more than one-half of this deficit explained by malaria. Furthermore, they found that a country with a high risk of infecting/developing deadly Malaria gets 16% less FDI than a similar county located in a malaria-free region.

A third plausible explanation is that a key component for improving health and hygiene conditions in a country is having effective and reliable wastewater treatment systems and excellent sewage connections. Untreated wastewater and poor sewage connections could lead to considerable environmental damage through water contamination.

Influences on demand conditions. With respect to the Factor Conditions dimension's influence on the Demand Conditions dimension: (a) Health and

Hygiene had a significant positive relationship with Prioritization of T&T, and (b) Natural Resources had a significant positive relationship with Prioritization of T&T. This first finding implies that if a country were to give greater attention to its health and hygiene conditions, then it can expect to see greater attention being given to its T&T industry regulations and policies. A plausible explanation for this finding is related to high tourism demand, namely, local tourism activity considerably increases the demand for local water and sanitation infrastructure. As a result, government is pressured to increase its expenditures toward improving its water and sanitation systems to meet that demand as part of its T&T development strategies. A second plausible explanation is that it is conceivable that the government uses the improvements to its health and hygiene conditions as an effective marketing and branding strategy for attracting international tourists.

The second finding implies that if a country were to improve its natural resources situation, then it could expect greater attention to be given to its travel and tourism industry. A plausible explanation for this finding is that natural resources such as beaches and oceans are essential to an economy, as locals and outside visitors have significant demand on the usage of these types of natural resources. It is reasonable to say that to some people, living without frequent visits to the beach and ocean would be inconceivable. As a result, if a government protects and improves these resources, it also would be enhancing its T&T development.

Influences on related and supporting industries. With respect to the Factor Conditions dimension's influence on the Related and Supporting Industries dimension, Health and Hygiene had a significant positive relationship with Safety and Security as well as with Ground and Port Infrastructure. These findings imply that as a country's regulations and policies relative to health and hygiene conditions improve, the country is expected to become more receptive to improving its safety and security conditions and improving its ground and port infrastructure conditions.

A plausible explanation for these findings is related to the wellbeing of the police force, which plays an important role in a country's safety and security. The day-to-day work of a police officer can be challenging and full of potential dangers, exposing them to violence and trauma. For example, a large part of any police officer's job involves dealing with physical and psychological pain, including getting attacked by criminals, seeing victims of violence or abuse, and at worse dealing with people dying. Therefore, it conceivable that the existence of outstanding health care providers including excellent hospitals with qualified and specialist medical physicians who can treat, aid, and rehabilitate traumatized and injured police officers so they can go back to their daily normal lives, leads, ultimately, to the enhancement of that country's safety and security.

Another plausible explanation is relative to the access to improved drinking water and sanitation, which is part of health and hygiene conditions. When a country has inadequate quantity and quality of drinking water and lacks sanitation

facilities, this could negatively impact the general health and hygiene of law enforcement officers, and hence, the country's level of safety and security.

A plausible explanation for the significant positive relationship Health and Hygiene had with Ground and Port Infrastructure is that the prevalence of a deadly disease such as malaria or HIV in a country could prevent the ground transportation sector from making any progress and improvements. For example, a country with a widespread deadly disease could scare away specialized and qualified transportation workers from working in that country, negatively impacting the development of ground transportation system negatively in that country.

Natural Resources also was found to have a significant positive relationship with International Openness, Air Transport Infrastructure, and Cultural Resources and Business Travel. These findings imply that as a country's regulations and policies relative to its natural resources improve, the country can expect to become more receptive to improving its international policies related to travel and tourism, to increasing its air transport infrastructure, and to developing and growing its cultural resources and business travel conditions. A plausible explanation for these findings is that when a country possesses abundant and/or unique natural resources and recognizes the economic gains it could receive from utilizing them, the country would be more open to foreign investments and to international visitors. Possible applications would include giving greater attention to international policies relative to travel and tourism such as by relaxing visa requirements and engaging in

bilateral air service agreements and regional trade agreements. It is reasonable to expect that a country might want to improve its air transport infrastructure to enable these economic benefits through the reception of international visitors across its airports. It also is reasonable to expect that a country would develop its cultural and business travel resources to create a secondary motivation for foreign visitors by providing more choices and supporting and adding value to its primary natural resources. These cultural resources include building unique and large sports stadiums, building super malls and movie theaters, and holding international conferences and concerts.

Firm strategy, structure, and rivalry. As summarized in Tables 4.12 and 4.13, and illustrated in Figure 4.3 in Chapter 4, the Firm Strategy, Structure, and Rivalry dimension, which consisted of the TTCI factors Business Environment and Environmental Sustainability, had a significant influence on the Factor Conditions dimension, the Demand Conditions dimension, and the Related and Supporting Industries dimension.

Influences on factor conditions. With respect to the Firm Strategy, Structure, and Rivalry dimension's influence on the Factor Conditions dimension, Business Environment and Environmental Sustainability each had a significant positive relationship on Health and Hygiene but not on Natural Resources. This finding implies that as countries improve or give increased attention to their regulations and policies relative to their business environment and environmental

sustainability matters, they also would see an improvement or increased attention to their health and hygiene conditions. A plausible explanation for this finding is related to the ramifications associated with improving the regulations and policies of business and sustaining and protecting the environment: Deteriorated health and hygiene conditions such as the prevalence of diseases, contaminated drinking water, and the lack of sanitation facilities will constitute a threat to any improvement of its business environment and environment sustainability. As a result, countries would tend to improve health and hygiene conditions to prevent that threat.

Influences on demand conditions. With respect to the Firm Strategy, Structure, and Rivalry dimension's influence on the Demand Conditions dimension: (a) Business Environment had a significant positive relationship with Prioritization of T&T, and (b) Environmental Sustainability had a significant negative relationship with Price Competitiveness. These findings imply that as countries increase their attention to their business environment policies, they would give greater priority and attention to regulations and policies relative to travel and tourism, including government expenditures, marketing efforts, and branding strategy. In contrast, as countries' regulations and policies relative to the conditions of environmental sustainability improve, those countries also would become less cost-competitive internationally relative to its travel and tourism expenditures,

including ticket taxes and airport charges, hotel prices, purchasing power, and fuel prices.

A plausible explanation for the first finding is related to the fostering of holistic strategies by governments: It is reasonable to expect countries that want to achieve sustained growth, are concerned for the wellbeing of its citizens, and champion rising income levels would incorporate holistic strategies designed to foster growth in other areas. One way this could be done would be to encourage and improve regulations and policies in other sectors such as travel and tourism industry. Another plausible explanation for this finding is related to investors' and economic agents' expectations and trust. For example, investors' expectations depend on: (a) the levels of trust in a country's government, exemplified in the regulations and policies relative to its business environment; (b) whether its public institutions are capable of transparently and efficiently enforcing property rights; and (c) whether the country has checks and balances, strong corporate governance standards, and prevailing business ethics. Therefore, better regulations and policies relative to a country's business environment would tend to lure and encourage local and foreign investors and financial agents to invest in all sectors of the economy, including travel and tourism.

A plausible explanation for the second finding is that pollution and environmental degradation, for all their ills, allow cheaper production and therefore lower prices due to the lack of compliance costs and lack of need to find more

expensive business solutions in the pursuit of environmental sustainability. For example, if climate regulations require airlines to adopt more fuel-efficient or lower-emission aircraft, although that change might yield economic benefits in the long-term, the increased costs of the aircraft in the short-term might be passed on in the form of higher ticket prices. Furthermore, if a country's higher level of environmental sustainability leads to greater interest from ecologically-minded tourists, the increased demand for that country as a destination could cause higher prices there.

Influences on related and supporting industries. With respect to the Firm Strategy, Structure, and Rivalry dimension's influence on the Related and Supporting Industries dimension: (a) Business Environment had a significant positive relationship with Safety and Security, Air Transport Infrastructure, and Ground and Port Infrastructure; and (b) Environmental Sustainability had a significant positive relationship on Safety and Security and International Openness. The first finding implies that when countries improve their business environment policies: (*i*) greater attention is given to addressing safety and security issues such as business costs of crime, violence, terrorism, homicide rates, and reliable police services; (*ii*) countries are more receptive to increasing their air transport infrastructure, including airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international); and (*iii*) countries increase their commitment to addressing regulations and policies toward

ground and port infrastructure conditions, including the quality of roads, road density, railroad and port infrastructure, and ground transport efficiency.

Plausible explanations for the findings in part (a) follow: With respect to (*i*), many indicators that make up the Business Environment factor in the TTCI have to do with the legal system, such as property rights and the efficiency of the legal framework, while Safety and Security also greatly involves the legal system (World Economic Forum, 2017a). The former might involve the civil legal system more heavily, while the latter has to do with the criminal legal system, but it is plausible that a country with a strong civil legal system would also tend to have a strong criminal legal system, and vice versa.

With respect to (*ii*) and (*iii*), which deal with Air Transport and Ground and Port Infrastructure, respectively, the regulation of Foreign Direct Investment (FDI) is an indicator within the Business Environment factor (World Economic Forum, 2017a). When foreign companies have an easier time making FDI in a country as a result of a friendlier legal system and regulations, they tend to become more actively involved in the corresponding industries, such as airlines, ocean shipping, or trucking. Also, increased speed and reduced cost of construction permits, which increase a country's Business Environment score (World Economic Forum, 2017a), would also make it easier to construct improvements to the various types of transportation infrastructure.

As for the second finding, (b) above, this implies that when countries increase their efforts toward sustaining their environment: (*i*) greater attention is given to addressing the safety and security issues listed above; and (*ii*) countries are more receptive to improving their international policies relative to T&T such as visa requirements, bilateral air service agreements, and regional trade agreements. With respect to (*i*), a plausible explanation is related to the stringency and degree of enforcement of environmental regulations. Both of these are indicators within the Environmental Sustainability factor (World Economic Forum, 2017a), and a strong government presence implied by high scores on each indicator would also be associated with the type of strong government presence that tends to foster safety and security. Similarly, with respect to (*ii*), the kind of involvement in international cooperation that would make a country consider signing regional trade agreements and economic integration agreements—a key indicator in the International Openness factor (World Economic Forum, 2017a)—would most likely also consider signing international agreements on environmental protection and sustainability.

Demand conditions. As summarized in Tables 4.12, 4.13, and 4.14, and illustrated in Figure 4.3 in Chapter 4, the Demand Conditions dimension, which consisted of the TTCI factors Prioritization of T&T and Price Competitiveness, had a significant influence on the Factor Conditions dimension; the Firm Strategy, Structure, and Rivalry dimension; and the Related and Supporting Industries dimension.

Influences on factor conditions. With respect to the Demand Conditions dimension's influence on the Factor Conditions dimension: (a) Prioritization of T&T had a significant positive relationship with Health and Hygiene, and (b) Prioritization of T&T also had a significant positive relationship with Natural Resources. The first finding infers that by giving higher priority to regulations and policies relative to T&T, countries could expect to see an improvement in their health and hygiene conditions. Plausible explanations for this finding were given previously in the discussion related to the influences of Factor Conditions on Demand Conditions, and the reader is directed to this discussion.

The second finding infers that as countries give higher priority to regulations and policies relative to travel and tourism, there would be an increase in the attention being given to regulations and policies relative to the countries' natural resources. Examples include the number of natural World Heritage sites, improvements in the attractiveness of their natural assets, and an increase in the percentage of protected areas. A plausible explanation for this finding was given previously in the discussion related to the influences of Factor Conditions on Demand Conditions, and the reader is directed to this discussion.

Influences on firm strategy, structure, and rivalry. With respect to the Demand Conditions dimension's influence on the Firm Strategy, Structure, and Rivalry dimension, (a) Prioritization of T&T had a significant positive relationship with Business Environment, and (b) Price Competitiveness had a significant

negative relationship with Environmental Sustainability. The first finding infers that by giving higher priority to regulations and policies relative to T&T, countries could expect to see an improvement or higher efficiency in their business environment regulations. A plausible explanation for this finding was given previously in the discussion related to the influences of Firm Strategy, Structure, and Rivalry on Demand Conditions, and the reader is directed to this discussion.

The second finding infers that as countries become more price-competitive internationally, there is less attention given to its policies/conditions relative to environmental sustainability. A plausible explanation for this finding was given previously in the discussion related to the influences of Firm Strategy, Structure, and Rivalry on Demand Conditions, and the reader is directed to this discussion.

Influences on related and supporting industries. With respect to the Demand Conditions dimension's influence on the Related and Supporting Industries dimension: (a) Prioritization of T&T had a significant positive relationship with both International Openness and Air Transport Infrastructure, and (b) Prioritization of T&T had a significant positive relationship with Cultural Resources and Business Travel.

The first finding infers that by giving higher priority to regulations and policies relative to travel and tourism, countries could expect to see greater openness to international visitors and cooperation in the form of relaxed visa requirements and more bilateral air service agreements and regional trade

agreements. They also should expect to see an increase in their air transport infrastructure, including airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international). A plausible explanation for this finding is that if a government decides to prioritize its country's travel and tourism industry, it would make the most sense to implement policies that would also allow for easier entry and transportation into the country. Also, private-sector actors such as airlines will tend to increase service to destinations that are popular with travelers, and governments' efforts to prioritize travel and tourism industries may increase their countries' popularity as destinations.

The second finding infers that by giving higher priority to regulations and policies relative to travel and tourism, countries could expect to see an improvement in their cultural resources and business travel aspects such as sports stadiums, international conferences, and cultural/entertainment for tourism. A plausible explanation for this finding is that companies will tend to invest more in tourist, cultural, and business destination activities in a country when it has emplaced the groundwork that facilitates travel and tourism, and for attracting more tourists from other destinations with its travel and tourism policies. Relatedly, the cultural resources that already exist in a country will tend to be stewarded and cultivated in such an environment.

Related and supporting industries. As summarized in Table 4.15 and illustrated in Figure 4.3 in Chapter 4, the Related and Supporting Industries

dimension consisted of these TTCI factors: Safety and Security, International Openness, Air Transport Infrastructure, Ground and Port Infrastructure, and Cultural Resources and Business Travel. These factors also had a significant influence on the Factor Conditions dimension, the Firm Strategy, Structure, and Rivalry dimension, and the Demand Conditions dimension.

Influences on factor conditions. With respect to the Related and Supporting Industries dimension's influence on the Factor Conditions dimension, Safety and Security as well as Ground and Port Infrastructure had a significant positive relationship with Health and Hygiene. This finding infers that as countries improve their safety and security issues as well as their ground and port infrastructure by giving attention to business costs of crime, violence, and terrorism; homicide rates; reliable police services; quality of roads; road density; railroad and port infrastructure; and ground transport efficiency, countries would realize improved health and hygiene conditions. Plausible explanations for these findings were given previously in the discussion related to the influences of Factor Conditions on Related and Supporting Industries, and the reader is directed to this discussion.

Complementing this finding, International Openness, Air Transport Infrastructure, and Cultural Resources and Business Travel all had a significant positive relationship with Natural Resources. This finding implies that: (a) improvements to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements results

in increased attention to natural resources, such as through making natural assets more attractive and through increased protection of natural areas; (b) increased attention to airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international) results in increased attention to natural resources as noted above; and (c) countries that increase their attention to cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment activities for tourists, can expect to see an increase in the attention given to natural resources. Plausible explanations for these findings were given previously in the discussion related to the influences of Factor Conditions on Related and Supporting Industries, and the reader is directed to this discussion.

Influences on firm strategy, structure, and rivalry. With respect to the Related and Supporting Industries dimension's influence on the Firm Strategy, Structure, and Rivalry dimension: Safety and Security, Air Transport Infrastructure, and Ground and Port Infrastructure had a significant positive relationship with Business Environment. This finding infers that: (a) Increased attention to safety and security issues such as business costs of crime, violence, and terrorism, homicide rates, and reliable police services results in more efficient business environment regulations and policies. This would include the time and cost to start a business, efficiency of the legal framework in settling disputes and challenging regulations, and tax related issues; (b) As countries give increased attention to issues such as

airport density, aircraft departures, number of operating airlines, and available seat kilometers (domestic and international), they can expect to see increased attention given to business environment regulations and policies as noted above; and (c) By improving the quality of roads, road density, railroad and port infrastructure, and ground transport efficiency, countries can expect to see increased attention given to that their business environment regulations and policies as noted above. Plausible explanations for these findings were given previously in the discussion related to the influences of Firm Strategy, Structure, and Rivalry on Related and Supporting Industries, and the reader is directed to this discussion.

Complementing these findings, Safety and Security as well as International Openness had a significant positive relationship with Environmental Sustainability. This finding implies: (a) As countries increase their attention to safety and security issues as noted earlier, they can expect to see increased attention to issues related to environmental sustainability such as enforcement of environmental regulations, sustainability of travel and tourism industry development, and wastewater treatment; and (b) As countries increase their attention to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements, they also can expect to see increased attention given to environmental sustainability as noted above. Plausible explanations for these findings were given previously in the discussion related to

the influences of Firm Strategy, Structure, and Rivalry on Related and Supporting Industries, and the reader is directed to this discussion.

Influences on demand conditions. With respect to the Related and Supporting Industries dimension's influence on the Demand Conditions dimension, both International Openness and Air Transport Infrastructure had significant positive relationships with Prioritization of T&T. This finding infers: (a) As countries increase their attention to international policies relative to travel and tourism such as visa requirements, bilateral air service agreements, and regional trade agreements, they can expect to see higher priority given to travel and tourism regulations/policies such as government expenditure, marketing efforts, and branding strategy; and (b) As countries improve the quality of their roads, road density, railroad and port infrastructure, and ground transport efficiency, they can expect to see higher priority given to travel and tourism regulations/policies as noted above. Plausible explanations for these findings were given previously in the discussion related to the influences of Demand Conditions on Related and Supporting Industries, and the reader is directed to this discussion.

In addition, Cultural Resources and Business Travel had a significant negative relationship with Prioritization of T&T. This finding infers that as countries increase their attention to cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment activities for tourists, they can expect to see lower priority

being given travel and tourism regulations/policies as noted above. A plausible explanation for this finding is that if a country currently has significant cultural and business travel resources attracting tourists, it might not feel the need to further increase government expenditures or optimize regulations to prioritize travel and tourism.

Research question 2. What is the relationship between the 14 factors of the travel and tourism competitiveness index and the per capita passenger capacity of the combined domestic and international airline flights originating within that country?

Available seat kilometers (ASK) is a measure of passenger carrying capacity within the airline industry and is considered to be a key economic indicator of airline performance. When applied to the context of the current study, ASK was manipulated to express the per capita annual average of weekly available seat kilometers (PCAAWASK) so that ASK could be compared among different countries by accounting for disparate population sizes. The purpose of Research Question 2 was to determine the extent to which the 14 factors of the targeted countries' TTCI were related to this measure. As presented in Chapter 4, the overall results of a simultaneous regression analysis showed that six TTCI factors were significant predictors of PCAAWASK: Health and Hygiene, Environmental Sustainability, Air Transport Infrastructure, Cultural Resources and Business Travel, Prioritization of T&T, and Price Competitiveness. A discussion of each

factor follows. The reader is reminded that PCAAWASK data were transformed to Log base 10 because they were skewed and therefore all interpretations of the results are made relative to the median.

Health and hygiene. As summarized in Table 4.16, Health and Hygiene had a significant positive relationship with PCAAWASK. This finding indicates that as a country's regulations and policies relative to health and hygiene conditions improve, the median per capita passenger capacity increases. More concretely, improvements to a country's health and hygiene conditions increase the country's airline seat capacity per week per capita.

A plausible explanation for this positive relationship is related to a country's reputation coupled with travelers' perceptions of that country. Consider, for example, a country that is known for malaria epidemics, high rate of HIV cases, poor sanitation, poor drinking water, or poor medical care via its hospitals or physicians. Such poor health and hygiene conditions might deter people from traveling to that country. As these conditions improve, though, it is reasonable to expect that the country's reputation for its health and hygiene conditions also would improve. This in turn could result in a higher demand to travel to that country for business purposes, tourism, or medical attention. This increase in travel would lead to an increase in airline seat capacity either by increasing the number of flights or by operating larger airplanes every week to meet that demand.

Environmental Sustainability. As summarized in Table 4.16, the Environment Sustainability factor had a significant negative relationship with PCAAWASK. This finding indicates that as a country's regulations and policies relative to environmental sustainability become strict and rigorous, the median per capita passenger capacity decreases. More concretely, a country's increased attention to sustaining its climate/environment results in a decline in the country's airline seat capacity.

A plausible explanation for this negative relationship is related to international policies and/or government regulations. For example, the International Civil Aviation Organization (ICAO), which is the international equivalent of the United States' Federal Aviation Administration (FAA), adopted a new aircraft CO_2 emissions standard designed to reduce the impact of aviation greenhouse gas emissions on the global climate. It is reasonable to conclude that a country's compliance with this standard could result in some aircraft not being able to fly into that country, which would lead to a reduction in the airline seat capacity. Along this same line, some countries also might adopt more rigorous environmental regulations to limit the net carbon emissions of international flights. This would require airlines to fly more efficient planes with sustainable lower-carbon alternative fuel to improve the local air quality. In such cases it is reasonable to conclude that some airlines would not be able to fly to or from these countries

because they do not have aircraft (fuel) to meet this requirement. This would then lead to a reduction in the airline seat capacity originating in these countries.

Air transport infrastructure. As summarized in Table 4.16, Air Transport Infrastructure had a significant positive relationship with PCAAWASK. This finding indicates that as a country's regulations and policies relative to its air transport infrastructure conditions improve, the median per capita passenger capacity increases. In other words, as countries give increased attention to and provide sufficient funding for improving airport density, aircraft departures, and number of operating airlines, they can expect to see an increase in the median per capita passenger capacity.

A plausible explanation for this positive relationship is related to the concepts of availability and demand. It is reasonable to assume that countries that operate more airports are able to accommodate more operating airlines/flights, which could then lead to more available air seats to the population. For example, according to WorldAtlas (2019), the United States has the highest number of airports in the world, with millions of passengers traveling through 14,712 airports every year. Therefore, the United States has the most operating airlines and available seats per kilometer (both international and domestic) than any other country (World Economic Forum, 2017a).

Along this same line, when a country possesses a well-developed air transport infrastructure, it is reasonable to conclude that this infrastructure will

reinforce and augment the number of operating airlines and flights in that country. Consequently, this would allow these operating airlines to fly to and receive from more destinations around the world, which would result in more available airline seats to the population in that country. As an example, consider the United Arab Emirates, which is ranked first in air transport infrastructure quality. According to Oxford Economics (2016), UAE transported and connected the most passengers, 70.7 million, around the world in 2014.

Cultural resources and business travel. As summarized in Table 4.16, Cultural Resources and Business Travel had a significant negative relationship with PCAAWASK. This finding implies that as countries give increased attention to their cultural resources and business travel conditions such as sports stadiums, international conferences, and cultural/entertainment for tourism, they can expect a decrease in the median per capita passenger seat capacity.

A plausible explanation for this negative relationship could be due to the effect of unexpected events on market demand such as the Gulf War in 1991, the tragedy of September 11, 2001, the Iraq War in 2003, and the global recession of 2008 (Mohammadiana, Abareshia, Abbasia, & Goh, 2019). The occurrences of such events largely reduce air travel demand on the affected country in both the long and short terms despite a country's increased attention given to its cultural resources and business travel. For example, Qatar has been focusing on improving the elements of its cultural resources and business travel such as designing and

building world-class soccer stadiums, modern shopping malls and entertainment parks, leisure activities, and nightlife events in preparation for hosting the World Cup. However, when Saudi Arabia, the United Arab Emirates, Bahrain, and Egypt launched an economic boycott of Qatar in June 2017, Qatar Airways and the other airlines operating in Qatar started to experience a decrease in air travel demand, which resulted in a reduction of air seat capacity (Egypt Today, 2017).

A plausible explanation for this negative relationship could be due to the effect of unexpected events on market demand such as war and terrorism (Mohammadiana, Abareshia, Abbasia, & Goh, 2019). It could be postulated that countries with a higher level of cultural and business travel resources might be more vulnerable to war and terrorism due to attempts to attack these very resources, and such attacks would provide tremendous deterrents to air travel to and from that country. For example, in 2017, Turkey had a terrorist attack that led to thousands of visitors canceling their trips to Turkey (Egypt Today, 2017).

Prioritization of travel and tourism. As summarized in Table 4.16, Prioritization of T&T had a significant positive relationship with PCAAWASK. This finding implies that when countries give increased priority and attention to regulations and policies relative to travel and tourism, including government expenditures, marketing efforts, and branding strategy, they can expect to see an increase in their median per capita passenger capacity.

A plausible explanation for this positive relationship is related to the perception of airlines relative to a country's priority for travel and tourism. For example, a country that recognizes the importance of T&T to its economy will most likely give priority to T&T by diversifying and augmenting its economy or applying marketing and branding strategies designed to attract tourists. These actions could lead to higher demand for travel to/from or within that country, and serve as a signal to airlines of the government's commitment to T&T. This perception of a country giving increased priority to T&T could then lead airlines to increase their domestic and international passenger seat capacity.

Price competitiveness. As summarized in Table 4.16, Price Competitiveness had a significant negative relationship with PCAAWASK. This finding implies that as a country becomes more competitive relative to the costs associated with travel and tourism—including government expenditures, marketing efforts, and branding strategy—the median per capita passenger seat capacity decreases. A plausible explanation for this negative relationship could be related to the unintended consequences of becoming more competitive. For example, it is reasonable to conclude that as governments open their markets to more airlines, there could be a greater increase in the presence of low cost or ultra low cost carriers. Because these carriers competitively charge lower ticket prices, this could drive full service carriers from key markets, which would lead to a loss in passenger seat capacity. Along this same line, if the focus of a country's T&T

strategy is to become competitive with respect to international travel, this could lead to a decrease in domestic (intra-country) air travel, which could reduce passenger seat capacity. Alternatively, this finding could be explained by a lack of airline capacity in a country being associated with fewer visitors to that country to bid up prices.

Implications

This section contains a discussion of the implications of the current study's results and is organized into three parts: (a) the implications of the results relative to Porter's diamond model theory presented in Chapter 2, (b) the implications of the results relative to the past studies presented in Chapter 2, and (c) implications for practice.

Implications relative to theory. The current study was grounded in Porter's (1998) diamond model theory, which represents an economic model that organizations can use to help them understand their competitive position in global markets. Porter's theoretical model posits reciprocal relationships among four dimensions of the international competitiveness of a particular industry in a particular country: (a) Factor Conditions; (b) Firm Strategy, Structure, and Rivalry; (c) Demand Conditions; and (d) Related and Supporting Industries. In the context of the current study, the targeted industry was travel and tourism, and the factors that could influence a country's global competitiveness was the 14 factors that comprised the Travel and Tourism Competitiveness Index (TTCI). The application

of the TTCI factors to the four dimensions of Porter's model was illustrated in Figure 4.2 in Chapter 4, and the current study examined these factors relative to all of the countries of the world for which TTCI data were available ($N = 136$).

In developing his model, Porter (1990) noted, "The effect of one point [on the diamond] often depends on the state of others" (p. 86). When applied to the current study, this observation corresponded to Research Question 1, which examined the reciprocal relationships among the TTCI factors relative to Porter's four dimensions. Also with respect to RQ 1, the current study's findings supported Porter's (1998) diamond model theory in that reciprocal relationships were present between all of the dimensions. As illustrated in Figure 4.3 and summarized in Tables 4.12–4.15 in Chapter 4, there were 19 combinations of TTCI factors that had significant reciprocal relationships. These are summarized in Table 5.2.

The reader will note from Table 5.2 that of the 19 unique reciprocal relationships, all were positive except for two: The relationship between Environmental Sustainability and Price Competitiveness was negative in both directions, and the relationship between Prioritization of T&T and Cultural Resources/Business Travel was positive in one direction but negative in the other direction. Also of note is that each dimension had at least one factor that was part of a significant reciprocal relationship, and the dimension with the most underlying factors was Related and Supporting Industries. The reader also will note that five TTCI factors were part of a significant positive reciprocal relationship with at least

Table 5.2

Summary of Significant Reciprocal Relationships

TTCI Factor	Dim.[a]		TTCI Factor	Dim.[a]
Health and Hygiene	FC	↔	Business Environment	FSSR
Health and Hygiene	FC	↔	Environmental Sustainability	FSSR
Health and Hygiene	FC	↔	Prioritization of T&T	DC
Health and Hygiene	FC	↔	Safety and Security	RSI
Health and Hygiene	FC	↔	Ground and Port Infrastructure	RSI
Natural Resources	FC	↔	Prioritization of T&T	DC
Natural Resources	FC	↔	International Openness	RSI
Natural Resources	FC	↔	Air Transport Infrastructure	RSI
Natural Resources	FC	↔	Cultural Resources/Business Travel	RSI
Business Environment	FSSR	↔	Prioritization of T&T	DC
Business Environment	FSSR	↔	Safety and Security	RSI
Business Environment	FSSR	↔	Air Transport Infrastructure	RSI
Business Environment	FSSR	↔	Ground and Port Infrastructure	RSI
Environmental Sustainability[b]	FSSR	↔	Price Competitiveness[b]	DC
Environmental Sustainability	FSSR	↔	Safety and Security	RSI
Environmental Sustainability	FSSR	↔	International Openness	RSI
Prioritization of T&T	DC	↔	International Openness	RSI
Prioritization of T&T	DC	↔	Air Transport Infrastructure	RSI
Prioritization of T&T[c]	DC	↔	Cultural Resources/Business Travel[c]	RSI

Note. All reciprocal relationships were positive in both directions unless otherwise indicated.
[a]Dim. refers to the four dimensions of Porter's (1998) diamond model theory: FC = Factor Conditions, FSSR = Firm Strategy, Structure, and Rivalry, DC = Demand Conditions, and RSI = Related and Supporting Industries. [b]This reciprocal relationship was negative in both directions. [c]This reciprocal relationship was positive in the first direction (→) but negative in the opposite direction (←).

one factor in the other three dimensions (independent of its own dimension): Health and Hygiene, Business Environment, Prioritization of Travel and Tourism, International Openness, and Air Transport Infrastructure. Based on these findings and on the importance of these reciprocal relationships to Porter's (1998) diamond model, it can be posited that these five factors are the most important for competitiveness in the international travel and tourism industry.

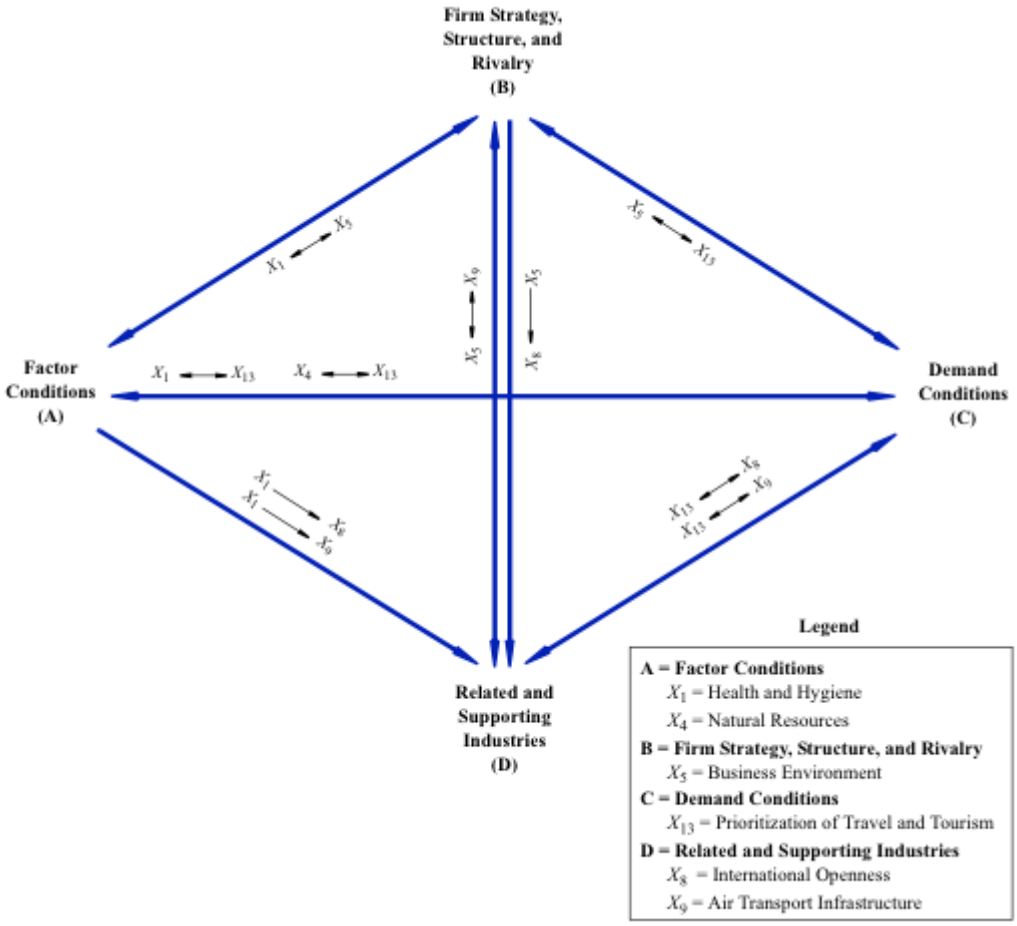


Figure 5.1. **The 5-factor simplified model of international T&T industry competitiveness based on Porter's (1998) diamond model, but supported by the current study.**

This finding also suggests the possibility of a simplified model of international T&T industry competitiveness based on Porter but supported by the current study: a diamond consisting of these five factors as illustrated in Figure 5.1. The only theoretical difference between this model and Porter's model is that three of the arrows would be unidirectional to reflect the respective one-way relationships. This new model would have the significant advantage of being immediately quantifiable with respect to the T&T industry.

With respect to Research Question 2, Porter's (1998) diamond theory of international competitiveness was applied from the perspective that the theory provides insight into how prosperity or productivity can be increased. When examined from this perspective, the current study used airline passenger seat capacity (both domestic and international) originating in a country as a measure of productivity. More specifically, the current study examined the relationship between the TTCI factors based on the four dimensions of Porter's model and airline seat capacity.

As summarized in Table 4.16 in Chapter 4, three TTCI factors had a significant positive relationship with airline seat capacity as a measure of productivity—Health and Hygiene, Air Transport Infrastructure, and Prioritization of Travel and Tourism—and three TTCI factors had a significant negative relationship with airline seat capacity—Environmental Sustainability, Cultural Resources and Business Travel, and Price Competitiveness. When examined with respect to Porter's model: (a) the Factor Conditions dimension had a single factor with a significant positive relationship (Health and Hygiene); the Firm Strategy, Structure, and Rivalry dimension had a single factor with a significant negative relationship with airline seat capacity (Environmental Sustainability), and the other two dimensions had factors with both significant positive and negative relationships.

The implication of these result to Porter's (1998) diamond theory is mixed: there was only one dimension with an unambiguous positive relationship with the targeted measure of productivity, one with an unambiguous negative relationship, and two with mixed relationships. This infers that airline seat capacity was not as strong a measure of productivity with respect to the TTCI factors and Porter's model, and that other measures of productivity might have yielded a result that more strongly supported Porter's model. It is noteworthy to mention, however, that when the findings of RQ 2 are applied to the simplified 5-factor model suggested by the results of RQ 1, there is a stronger support to Porter's (1998) diamond model. When applied to the simplified model, three of the five factors had significant positive relationships with airline passenger capacity (Health & Hygiene, Air Transport Infrastructure, and Prioritization of T&T). The remaining two factors, though, either were insignificant (Business Environment) or needed to be excluded from the final analysis (International Openness).

Implications relative to past studies. This section provides a comparison of the current study's findings as they relate to the findings of the prior research presented in Chapter 2. The first category of study reviewed was competitiveness analyses of other industries using Porter's (1998) diamond model. Vu and Pham (2016) performed such an analysis of Vietnam and China's Garment and Textile (G&T) industries and found Vietnam especially weak compared to China relative to Porter's Related and Supporting Industries dimension. Although the current

study did not make country-to-country comparisons for the travel and tourism industry, the results of the current study did find that the TTCI factors associated with the Related and Supporting Industries dimension were significant. When juxtaposing the results of the current study with those of Vu and Pham, an implication is that additional credence may be given to the applicability of Porter's model to different industries.

Another category of studies reviewed presented alternative models to Porter's (1998) for countries' international competitiveness in the T&T industry. One such alternative model was from Dwyer and Kim (2003), which served as the basis on which the current study aligned the TTCI factors to Porter's four dimensions. As explained in Chapter 2, the Dwyer and Kim's model maps nearly identically to Porter's model with only a few differences. The results of the current study were consistent when applied to Dwyer and Kim's model. The results of the current study also shed light on the question of which dimensions in Dwyer and Kim's model are most important. For example, Prioritization of T&T, which was associated with Porter's Demand Conditions dimension, was one of five TTCI factors that had a reciprocal relationship with TTCI factors in the other three dimensions of Porter's (1998) model. Prioritization of T&T also was one of three factors that had a significant positive relationship with airline passenger capacity. As a result, this factor may be considered one of the most important factors for international T&T industry competitiveness. When applied to Dwyer and Kim's

model, this finding gives support to the importance of Dwyer and Kim's Demand dimension, which is reasonable because it highlights the efficacy of government and private-sector efforts to cultivate demand for the T&T industry in a country. Continuing with this comparison, the next two most important factors derived from the current study were Health and Hygiene and Business Environment. This implies that the corresponding dimensions in Dwyer and Kim's model, Resources (specifically, supporting resources) and Situational Conditions, respectively, are the next most important.

Ritchie and Crouch (2010) was another study that presented an alternative model to that of Porter (1998), and it greatly informed the current study's grouping of TTCI factors into the dimensions of Porter's diamond model, especially with respect to grouping Air Transport Infrastructure and International Openness under Porter's Related and Supporting Industries dimension. The current study's results effectively supported Ritchie and Crouch in that these two factors were among the five most important to international travel and tourism industry competitiveness as a result of their significant positive reciprocal relationships as well as their significant positive relationship with airline passenger capacity.

With respect to Research Question 2, the results of the current study were consistent with Webster and Ivanov (2014). For example, similar to Webster and Ivanov, the current study did not show a significant relationship between international competitiveness in the T&T industry and economic growth. The

findings of the current study also were consistent with Yu et al. (2016) who reported that lower fixed costs for a given level of ASKs indicated higher capacity utilization, which infers higher productivity. This inverse relationship also was observed in the current study relative to the negative relationship between Price Competitiveness and airline seat capacity: as competitiveness increases, which results in a decrease in associated costs such as ticket prices and seat capacity as a measure of productivity increases.

Lastly, the results of the current study relative to RQ 2 were mixed when compared to those of Cirstea (2014). Similar to Cirstea, the current study examined TTCI factors, but there were three major differences: Cirstea used a different dependent variable (overall TTCI scores), examined a different year of TTCI data, and had a much more limited sample size of countries. Nevertheless, some aspects of the current study's results were consistent with Cirstea. For example, similar to Cirstea, the TTCI factors Health and Hygiene, Air Transport Infrastructure, and Prioritization of T&T were significant, and Price Competitiveness had a negative relationship with T&T competitiveness. Unlike Cirstea, though, the current study found that Environmental Sustainability and Cultural Resources/Business Travel factors had a negative relationship with T&T competitiveness (as measured by airline passenger capacity) whereas Cirstea reported a positive relationship. A plausible reason for this inconsistency could be because of the timeframe and sample size as noted earlier. It is noteworthy to point out that even though the

circumstances/conditions of the two studies were different, both studies still found Health and Hygiene, Air Transport Infrastructure, and Prioritization of T&T to be significant factors. This gives further credibility to the efficacy of these factors with respect to the travel and tourism industry.

Implications for practice. In addition to implications relative to theory and prior research, the current study's findings also have implications for practice within the aviation profession. The first implication is relative the TTCI factor, Prioritization of Travel and Tourism. The reader will recall that this factor was the single most important factor for increasing international competitiveness of a country's travel and tourism industry, and it had a significant positive relationship with airline passenger capacity as a measure of productivity. This finding implies that promoting travel and tourism within a country and giving it a high priority can be beneficial to the country's international reputation and yield greater prosperity. Furthermore, because of its influence on other TTCI factors—including International Openness, Air Transport Infrastructure, Cultural Resources/Business Travel, and Natural Resources—this finding also implies that a country could see improvements in these areas as well, which could further increase its global competitiveness within the travel and tourism industry.

A second implication of the study's results relative to practice is related to the TTCI factor, Health and Hygiene. The reader will recall that this factor had significant positive reciprocal relationships with several factors, and it had a

significant positive relationship with airline passenger capacity. This finding implies that by improving the health and hygiene conditions within a country can enhance the country's travel and tourism international competitiveness as well as its domestic and international airline passenger capacity. Furthermore, because of its influence on other TTCI factors—including Business Environment, Environmental Sustainability, Safety and Security, and Ground and Port Infrastructure—this finding also implies that a country could see improvements in these areas as well, which could further increase its global competitiveness within the travel and tourism industry.

A third implication of the study's results relative to practice is related to the TTCI factor, Air Transport Infrastructure. The reader will recall that this factor had significant positive reciprocal relationships with factors in all of the other dimensions of Porter's (1998) diamond model, and it had a significant positive relationship with airline passenger capacity. This finding implies that improving a country's air transport infrastructure is key to enhancing the country's global competitiveness. This is because its influences would be felt across the entire spectrum of the travel and tourism industry, making its impact widespread relative to Porter's dimensions. Furthermore, because of its influence on other TTCI factors—including Business Environment, Natural Resources and Prioritization of T&T—this finding also implies that a country could see improvements in these

areas as well, which could further increase its global competitiveness within the travel and tourism industry

A fourth implication of the study's results relative to practice is related to the TTCI factor, Business Environment. The reader will recall that this factor had significant positive reciprocal relationships several TTCI factors, including Health and Hygiene, Prioritization of T&T, Safety and Security, Air Transport Infrastructure, and Ground and Port Infrastructure. This finding implies that improving the business environment within a country could make the country's travel and tourism industry more globally competitive, and it could have tangential effects on the other related TTCI factors cited above.

A fifth implication of the study's results relative to practice is related to the TTCI factor, International Openness. This factor had significant relationships with the TTCI factors of Natural Resources, Environmental Sustainability, and Prioritization of T&T. This finding implies that by focusing and improving on International Openness could increase the global competitiveness of a country's travel and tourism industry. Furthermore, because this factor also influence the three other TTCI factors cited above, this implies that these other factors also could be improved through increased attention to international openness, which in turn would make the country's travel and tourism industry even more competitive internationally.

Generalizability, Limitations, and Delimitations

Generalizability. Generalizability refers to the extent to which the results of a study could be extended beyond the scope of the current study. This is also known as external validity. Generalizability is considered from two perspectives: population generalizability and ecological generalizability. To determine the extent to which the findings may be applied to the target population and other settings, detailed information about how the study was conducted and the results are provided in Chapters 3 and 4 of this dissertation.

As noted in Chapter 3, the target population of the current study was all of the countries in the world ($N = 195$), and the accessible population was comprised of the countries of the world that had 2017 Travel and Tourism Competitiveness Index (TTCI) scores. The sample consisted of the entire accessible population, which represented $N = 136$ countries. Because the current study's sample was the entire accessible population, the sampling strategy was a census and therefore generalizability of the results may be made directly to the accessible population. Additionally, because the countries that comprised the sample represented 70% of the countries in the world and encompassed 98% of world GDP (World Economic Forum, 2017b, p. 8), the current study's findings also are generalizable to the target population.

With respect to ecological generalizability, which refers to different settings or conditions, the study's results are limited to the travel and tourism industry

because only TTCI factors were studied. This is because with the exception of Porter's Factor Conditions dimension, other industries are likely to be comprised of very different factors than those applied to travel and tourism. Therefore, the ecological generalizability of the results to other industries is limited other than to say that the current study's support of Porter's model in the T&T industry make it more likely that there would be support of it in other industries. With respect to generalizing the current study's results to other time periods with regard to the T&T industry, the same industry factors are likely to be at play in other time periods, so the current study is ecologically generalizable in that sense. The only exception to this generalizability would be if major technological advances change the mix of important T&T industry factors to take into account in Porter's (1998) diamond model. For instance, 100 years ago air travel would not have been a significant factor for the T&T industry, and it is conceivable that future advances could necessitate other transportation avenues being included in the analysis.

Study limitations and delimitations. As with every research study, the current study was subjected to several limitations and delimitations. The limitations and delimitations of the current study as presented in Chapter 1 are replicated here as a courtesy to the reader so they are easily accessible when presenting recommendations for future research relative to the study's limitations and delimitations.

Limitations. Limitations are conditions, events, or circumstances outside the control of the researcher that could limit the generalizability of the study results. The limitations of the current study were as follows.

1. Data integrity. The current study relied on archival data stored in publicly accessible databases. For example: (a) scores relative to the international competitiveness in the T&T industry were acquired from the WEF's (2017) TTCI methodology; (b) the calculation of PCAAWASKs was based on data reported by the aviation authority of each country, various industry statistical reporting outlets, and/or the airlines themselves, depending on the country; and (c) the population statistics for the per capita calculations came from various sources including census bureaus. Because I did not have any control over the record keeping of the data collection instruments or the integrity of the data that were collected and stored in the databases, data integrity could be problematic. As a result, subsequent studies similar to the current one that use different data sources or are able to confirm the integrity of the data they use might yield different results.

2. Excluded and included countries. The 2017 Travel and Tourism Competitiveness Report (TTCR) excluded certain countries that were in the previous 2015 TTCR. Additionally, the 2017 TTCR included new countries that were not in the 2015 TTCR. As a result, similar studies that use the 2015 TTCR or any previous or subsequent edition of TTCR that do not include the same $N = 136$ countries of the world used in the current study might obtain different results.

Delimitations. The delimitations of a study are factors such as conditions, influences, or circumstances that a researcher imposes to make the study feasible to implement. These additional restrictions are needed from a practical perspective but have the potential to further limit the generalizability of the results. The delimitations of the current study are given here, and the reader is advised to consider any conclusions or inferences emanating from the study's results with respect to these delimitations.

1. Theoretical grounding. The current study was grounded in Porter's (1998) diamond theory reciprocal model of international competitiveness applied to international competitiveness in the T&T industry using data from 2017 TTCR. The study was expressly designed to (a) determine the extent to which the TTCI factors reflected reciprocal relationships as given in Figure 1.1 relative to the four dimensions of Porter's model, and (b) to examine the relationship the TTCI factors had with airline seat capacity as a measure of productivity relative to Porter's model. As a result, subsequent studies similar to the current one that are grounded in a different model of competitiveness might yield different results.

2. Research methodology. The research methodology of the current study was correlational, and the results of the study were applied to help explain or predict the relationships across all four dimensions of Porter's (1998) model: Factor Conditions; Demand Conditions; Firm Strategy, Structure, and Rivalry; and Related and Supporting Industries. As a result, subsequent studies similar to the

current one that use a different methodology such as structured equation modeling (SEM), a qualitative approach, or mixed methods might yield different results.

3. Measurements of international competitiveness. The current study used data from the Travel and Tourism Competitiveness Index (TTCI) to measure international competitiveness. As a result, subsequent studies similar to the current one that use a different measure of international competitiveness such as the International Management Development's World Competitiveness Yearbook, International Federation of Commerce's Business Competitiveness—Ease of Doing Business Report, and the WEF's Global Competitiveness Report (GCI), might yield different results.

4. Measurement of airline industry activity. The current study used airline seat capacity as a measure of airline industry activity, which was considered a measure of productivity. Seat capacity was calculated on a per capita annual average of weekly available seat kilometers (PCAAWASK) of each flight. As a result, subsequent studies similar to the current one that use a different measure of airline industry activity—such as number of passengers, flight miles, airline revenues, airline profits or margin, or other profitability ratios—or use a different calculation method might yield different results.

5. Per capita GDP. As noted above, airline seat capacity as a measure of productivity for each country was chosen as the current study's dependent variable for Research Question 2. An alternative dependent variable could have been per

capita real GDP (adjusted for inflation). Thus, subsequent studies similar to the current one that use this alternative dependent variable (or another one) might get different results.

6. Timeframe. The current study was based on the 2017 TTCI report and hence represented a cross-sectional study. This means that subsequent studies similar to the current one that use TTCI report from a different year might yield different results.

7. Grouping of TTCI factors to Porter's dimensions. The current study relied on Dwyer and Kim (2003) and Ritchie and Crouch (2010) to group the TTCI factors with respect the four dimensions of Porter's (1998) model. Therefore, subsequent studies similar to the current one that rely on a different grouping source or use a different approach to grouping the factors might not get the same results.

8. Transposition of airline seat capacity data. As presented in Chapter 4, the PCAAWASK data were highly skewed right and were subsequently transposed using Log base 10 to satisfy the linearity and normality assumptions of regression. This resulted in an interpretation of the results relative to the median. As a result, subsequent studies similar to the current one that do not transpose airline seat capacity data or using a different transposition approach might not get the same results.

9. Presence of outliers. As noted in Chapter 4, an outlier analysis using Jackknife distances flagged several outliers in both parts A and B of the current study. These outliers reflected rare cases and not contaminants. Because of the prominence of these rare-case countries on the world stage— for example, both Canada and China are economic world powerhouses, and UAE's airport is once the busiest airport in the world—these outliers were retained and not eliminated. As a result, subsequent studies similar to the current one that do not include the outliers in the final analysis might not get the same results.

Recommendations for Future Research and Practice

This section presents recommendations arising from the findings of the current study. The first two sets of recommendations are made for future research relative to the study's limitations and delimitations, respectively, the third set of recommendations is for future research based on the implications to prior research and theory, and the last set of recommendations is for future research based on the implications for practice.

Recommendations for future research relative to study limitations. The following list of recommendations for future research is based on the study's limitations, which were provided earlier in this chapter as well as in Chapter 1.

1. I did not have any control over the record keeping of the data collection instruments or the integrity of the data that were collected and stored in the databases used for the current study. Therefore, a recommendation for future

research relative to this limitation is to replicate the study using the same statistical models and parameters but use a different data source. For example, future studies could involve researchers collecting data themselves through measures such as focus groups for qualitative data, surveys, and/or inquiring into organizations' own records for quantitative data rather than relying on a publicly accessible database such as the WEF's (2017) TTCI. This approach would require a lot of time and resources but would give the researcher control over the integrity of the data.

2. I did not have any control over the N = 136 countries that were included in the 2017 TTCI report, and subsequent reports will undoubtedly have different countries. For example, the 2015 TTCI report, which was the most recent report prior to 2017 had $N = 141$ countries, and the 2019 report had $N = 140$ countries. Furthermore, the countries included change from one report to another. Therefore, a recommendation for future research relative to this limitation is to replicate the current study using TTCI reports prior to and after 2017 to see if similar results are obtained.

Recommendations for future research relative to study delimitations.

The following list of recommendations for future research is based on the study's delimitations, which were provided earlier in this chapter as well as in Chapter 1.

1. I grounded the current study in Porter's (1998) reciprocal diamond model theory. Although Porter's model is considered the most prevalent model of

international competitiveness that can be applied across all industries, other models have been developed that are more parochial. Therefore, a recommendation for future research relative to this delimitation is to apply these models of international competitiveness to TTCI data. For example, one suggestion is to apply TTCI data of European countries to the European Council on Competitiveness (COMPET) model (Voinescu & Moisoiu, 2014).

2. I used a correlational research methodology to help explain or predict the relationships across all four dimensions of Porter's (1998) model. Therefore, a recommendation for future research related to this delimitation is to replicate the current study using a different methodology such as Structured Equation Modeling (SEM), a qualitative approach, or mixed methods.
3. The current study's data were extracted from the Travel and Tourism Competitiveness Index (TTCI) to measure international competitiveness. Therefore, a recommendation for future research relative to this delimitation is to use data from other publicly accessible data sources. Suggestions include: (a) International Management Development's World Competitiveness Yearbook, (b) International Federation of Commerce's Business Competitiveness—Ease of Doing Business Report, (c) the WEF's Global Competitiveness Report (GCI), (d) the Institute for Strategy and Competitiveness (ISC), and (e) the International Institute for Management Development (IMD) (Dusa, 2014).

4. Seat capacity as a measure of airline productivity was calculated on a per capita annual average of weekly available seat kilometers (PCAAWASK) of each flight. Therefore, a recommendation for future research relative to this delimitation is to use an alternative to PCAAWASK. Possibilities include number of passengers, flight miles, airline revenues (especially revenue passenger miles), airline profits or margin, or other profitability ratios.
5. The current study did not use real per capita GDP adjusted for inflation in its calculation of per capita annual average of weekly available seat kilometers (PCAAWASK). Therefore, a recommendation for future research relative to this delimitation is to calculate PCAAWASK using per capita GDP adjusted for inflation.
6. The current study was cross-sectional in nature because it was based on the 2017 TTCI report. Therefore, a recommendation for future research relative to this delimitation is to use TTCI reports from different years. Such replication studies would be important for further supporting the application of Porter's (1998) diamond model to the T&T industry.
7. The current study grouped the TTCI factors relative to the four dimensions of Porter's (1998) model by consulting Dwyer and Kim (2003) and Ritchie and Crouch (2010). Therefore, a recommendation for future research relative to this delimitation is to consult different sources to guide this grouping.

8. Because the PCAAWASK data were highly skewed right, the data were transposed using Log base 10 to satisfy the linearity and normality assumptions of regression. A recommendation for future research relative to this delimitation is to transpose these data using a natural log transformation, which would enable the interpretations to be made relative to a percentage change in the DV.
9. The current study kept outliers in the final analysis for both parts of the study. These outliers were rare cases and reflected prominent countries on the world stage such as Canada and China. A recommendation for future research, therefore, is to delete these cases to see what impact their absence has on the final results.

Recommendations for future research relative to implications. The following list of recommendations for future research is based on the study's implications relative to theory and prior research.

1. A direct result of applying the TTCI factors to Porter's (1998) model was the emergence of a more simplified 5-factor model as illustrated in Figure 5.1. As a result, this simplified model deserves further research in terms of applying it as a quantified composite indicator of T&T competitiveness, and as an alternative to the overall TTCI score, which was not used in the current study due to its lack of support in the literature and from theory. This composite score could consist of a simple average of the scores of each of the four dimensions, with three dimensions consisting of the score of a single TTCI factor, and the Related and

Supporting Industries dimension's score consisting of an average of the two TTCI factor scores that comprise it. This composite score could then, itself, be tested against various data including PCAAWASK or other measures of airline activity. Although this might yield different results than the current study, the results could lend even more support to Porter's (1998) diamond model.

2. Most of the TTCI factors aligned perfectly to the dimensions in Porter's (1998) model except for the Firm Strategy, Structure, and Rivalry dimension. This dimension had two TTCI factors grouped under it, Business Environment and Environmental Sustainability, which were measured in the TTCI by indicators that reflected rivalry and, to a limited extent, firm structure, in the former case, and only firm strategy to a limited extent in the latter case. Thus, this dimension was not fully captured relative to Porter's model—especially strategy and structure. Therefore, a recommendation for future research is to address specifically target prominent firms in each country to quantify various aspects of their strategy and structure as well as degree and form of rivalry in accord with Porter's model.
3. The current study revealed that airline seat capacity was not a strong measure of productivity with respect to the TTCI factors and Porter's (1998) model. Therefore, a recommendation for future research is to search for other measures of productivity that are better aligned to Porter's model.

4. The fact that the current study supported Porter's (1998) diamond model with respect to the T&T industry strongly suggests that the model should now be quantitatively applied in a similar way to other industries in future research, similarly to the current study, as such studies are currently nonexistent. An advantage of Porter's (1998) model for such research is that it is intended to be universal for all industries; this hypothesis could thereby be tested.
5. The results of the current study were consistent with those of Vu and Pham (2016) with respect to the Related and Supporting Industries dimension of Porter's (1998) model even though both studies examined different industries. As a result, a recommendation for future research is to focus exclusively on this dimension in other industries.
6. The results of the current study were consistent with two dimensions of Dwyer and Kim's (2003) alternative model: Resources and Situational Conditions. As a result, a recommendation for future research is to focus on these two dimensions using other data from other TTCI reports to confirm or refute this finding.
7. The results of the current study were consistent with two dimensions of Ritchie and Crouch's (2010) alternative model: Air Transport Infrastructure and International Openness. As a result, a recommendation for future research is to focus on these two dimensions using other data from other TTCI reports to confirm or refute this finding.

8. The current study's findings were consistent with Yu et al. (2014) in that both studies reported a negative relationship between fixed costs and productivity. When applied to the TTCI factors, this relationship is relative to Price Competitiveness and airline seat capacity: as competitiveness increases, which results in a decrease in associated costs such as ticket prices and seat capacity as a measure of productivity increases. As a result, a recommendation for future research is to examine this factor for other TTCI reports relative to airline seat capacity to confirm or refute this relationship.
9. As noted in the first recommendation given in this section, a recommendation for future research was to apply the simplified 5-factor model that emerged from data analysis as a quantified composite indicator of T&T competitiveness, and as an alternative to the overall TTCI score. Accenting this recommendation, this research also could shed light on the mixed results between the current study and Cirstea (2014) in terms of the relationships between TTCI factors and T&T industry competitiveness, or the results of that competitiveness in the form of productivity. Therefore, this previous recommendation also is applicable here.

Recommendations for practice relative to study implications. The recommendations for practice listed below are based on the study's implications for practice as presented earlier.

1. The current study's findings found that promoting travel and tourism within a country and giving it a high priority can be beneficial to the country's

international reputation and yield greater prosperity. Therefore, a recommendation for practice is for countries that do not yet have a T&T industry bureau or government office to promote that industry, should establish one. It is further recommended that this bureau—on its own and/or in collaboration with other relevant government agencies—increase expenditures (transfers or subsidies) on, for example, cultural attractions such as art museums and recreational activities such as national parks.

2. The reader will recall that Health and Hygiene had significant positive reciprocal relationships with several factors, and it had a significant positive relationship with airline passenger capacity. Therefore, if a country desires to improve its T&T international competitiveness and increase its airline passenger capacity domestically and internationally, it is recommended that they improve its health and hygiene conditions. Examples of how this could be done include providing adequate drinking water in terms of quantity and quality for both local and international visitors as well as sufficient sanitation facilities at locations that are expected to host visitors. In addition, an important beneficial endeavor for a country to undertake in this regard would be to put in place policies to reduce the prevalence of deadly diseases such as HIV and malaria. Finally, other components of health and hygiene conditions that are recommended include increasing the number of hospital beds per capita and the

number of physicians per capita, including generalist and specialist medical practitioners.

3. The reader will recall that Air Transport Infrastructure had a significant positive relationship with airline passenger capacity as well as significant positive reciprocal relationships with factors in all of the other dimensions of Porter's (1998) diamond model. Therefore, for countries that want to improve their international T&T industry competitiveness, a recommendation for practice is to give attention to their air transport infrastructure by, for instance, increasing the number of airports and flight departures per capita as well as the number of operating airlines there. Building new airports, improving existing airports, and increasing a country's air connectivity, in general, is likely to yield benefits to that country's T&T industry.
4. The reader will recall that Business Environment had significant positive reciprocal relationships several TTCI factors, including Health and Hygiene, Prioritization of T&T, Safety and Security, Air Transport Infrastructure, and Ground and Port Infrastructure. Therefore, a recommendation for practice is for countries to give attention to their business environment if they want to enhance their international T&T industry competitiveness. Examples include: (a) enhancing the protection of property rights; (b) enhancing the efficiency of the legal framework for settling disputes and challenging regulations; (c) reducing the cost and time required to obtain construction permits or start a business; (d)

encouraging foreign direct investment; (e) increasing the number of firms active in a country; (f) reducing taxes on labor, profits, and other activities; and (g) reducing the deterrent effect of taxation on working and investing.

5. The reader will recall that International Openness had significant relationships with the Natural Resources, Environmental Sustainability, and Prioritization of T&T. As a result, to increase international T&T industry competitiveness, a recommendation for practice is for countries to focus on improving their international openness. Examples include relaxing visa requirements, engaging in bilateral air service agreements such as the Open Skies Agreement, and engaging in regional trade and economic integration agreements.

Final Comments and Observations

1. If it could be documented that a country (its government and/or private sector organizations) follows the recommendations for practice given in this section for enhancing the T&T industry in that country—either on its own accord or influenced by this study or one like it—then future research of an experimental or ex post facto design could be carried out to test the hypothesis that these recommendations were successful. In an experimental design, T&T industry competitiveness scores could be compared between a period prior to the implementation of these recommendations and afterward. A control group would consist of countries that had not implemented these recommendations. An ex post facto design would involve dividing the countries of the world into two

or more groups depending on the degree to which they had implemented these recommendations and comparing them against each other using data from the same time period. This research could be challenging in that there are three types of experimental designs: true, quasi (similar to ex post facto), and weak, and it would be virtually impossible to have a strong experimental design under these conditions. It would certainly be impossible to have true or double blind experimental protocols for the groups of countries and would be extremely difficult to control for confounding factors. Therefore, an ex post facto design might be preferable, but these decisions would depend on the specifics of the possible interventions being investigated (ex post facto research would not need to even incorporate interventions, per se, just differences between groups) and the data collection instruments used.

2. The reader will recall that the airline seat capacity data were highly skewed right, which warranted a transformation via Log base 10. The corresponding descriptive statistics of the data prior to transformation were as follows: M = 55.0 (SD = 95.6), with a range of 0.14 to 751.2, and a corresponding skewness factor of 4.25. The reader will note the standard deviation is more than 50% of the mean, which indicates extremely high variability in the reported results. Furthermore, as inferred above, the mean was far to right of the median, which indicates extreme skewness. Together, these two observations are indicators of a complex system, which consists of four parameters: diversity, connectiveness,

interdependency, and robustness. Therefore, subsequent studies involving airline seat capacity as measured by PCAAWASK might benefit by approaching such studies from a complex system perspective and manipulating all four corresponding parameters.

3. The current study was based on an aggregate analysis involving the TTCI factors. As noted in Table 1.1, the countries covered by the TTCI factors are organized by regions: Europe and Euraisa, The Americas, Middle East and North Africa, Sub-Saharan Africa, and Asia and Pacific. It might be interesting to perform a secondary analysis of the current study's data set by disaggregating the data by regions to determine the extent to which Porter's (1998) diamond model applies to each region.
4. The results of the current study could be driven by Europe and the developed countries. Therefore, it also might be interesting to perform a secondary analysis by disaggregating the data with respect to industrial vs. nonindustrial countries, or by groups of countries that have one or more common factors.
5. As summarized and depicted in Figure 5.1, six TTCI factors were most prominent: Business Environment, International Openness, Prioritization of Travel and Tourism, Health and Hygiene, and Air Transport Infrastructure, and Natural Resources. Of these, the first two are "external" whereas the remaining four are "internal." It might be interesting to examine the data from these two perspectives.

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Appendix A

Raw Data

Table A.1
Raw D1ata

Countries	*Y*	*X*1	*X*2	*X*3	*X*4	*X*5	*X*6	*X*7	*X*8	*X*9	*X*10	*X*11	*X*12	*X*13	*X*14	TTCI	A–D	A–I	A–T	Pop.
Albania	5.97	5.2	4.9	4.1	2.2	4.1	4.1	5.7	2.4	2.0	3.1	3.9	1.1	4.6	4.7	3.4	0.00	19.21	19.21	3.22
Algeria	5.33	4.9	4.0	3.7	2.2	4.0	3.7	5.3	1.5	2.1	2.5	2.1	2.1	2.8	6.0	3.1	28.01	163.68	191.69	35.98
Argentina	21.34	6.4	4.6	4.7	4.4	3.1	3.4	5.0	2.8	2.7	2.6	4.5	4.5	4.6	4.1	4.1	308.14	561.93	870.07	40.76
Armenia	13.74	5.9	4.8	4.3	2.6	4.9	3.8	5.9	2.6	2.2	2.9	3.9	1.4	4.6	4.8	3.5	0.00	42.59	42.59	3.10
Australia	202.48	6.1	5.1	6.0	5.2	5.1	4.5	6.1	4.8	5.7	3.6	6.1	5.0	5.1	3.8	5.1	1738.06	2782.09	4520.15	22.32
Austria	57.31	6.7	5.5	5.8	4.1	5.0	5.6	6.3	4.0	3.9	5.2	6.7	3.1	5.3	3.9	4.9	4.73	478.07	482.80	8.42
Azerbaijan	10.50	6.1	5.0	5.0	2.4	4.6	4.0	5.8	2.9	2.4	3.7	3.3	1.7	4.8	5.4	3.7	0.44	95.90	96.34	9.17
Bahrain	124.14	5.2	4.7	6.0	1.7	5.5	3.8	5.7	2.9	3.5	5.2	4.9	1.3	4.3	5.5	3.9	0.00	164.31	164.31	1.32
Bangladesh	1.76	4.3	3.8	3.1	2.4	4.1	3.4	3.7	2.5	1.9	3.1	1.9	1.6	3.2	4.7	2.9	7.42	257.41	264.83	150.49
Barbados	232.76	6.0	4.7	5.2	2.3	4.4	4.7	5.6	2.8	3.8	5.2	4.9	1.2	5.8	3.0	3.9	0.00	63.76	63.76	0.27
Belgium	63.16	6.7	5.3	5.7	2.2	4.9	4.6	5.9	4.1	3.7	5.7	5.3	4.1	4.5	4.4	4.5	0.19	695.85	696.03	11.02
Benin	2.08	2.9	4.5	2.7	2.7	4.3	3.9	5.2	1.5	1.7	2.3	2.4	1.2	3.1	4.9	2.8	0.00	18.94	18.94	9.10
Bhutan	4.14	4.6	4.3	3.9	3.5	4.7	4.6	6.1	2.9	2.7	2.5	2.7	1.3	5.0	6.0	3.6	0.04	3.02	3.05	0.74
Bolivia	8.68	4.4	4.0	3.8	4.0	3.0	4.2	5.0	2.8	2.2	2.2	3.3	2.0	3.6	4.3	3.3	35.83	51.71	87.54	10.09
Bosnia & Herz.	3.51	5.7	4.2	4.3	1.8	3.6	3.9	5.4	2.4	1.8	2.5	3.9	1.4	3.7	4.3	3.1	0.00	13.18	13.18	3.75
Botswana	3.83	3.5	4.5	4.1	3.5	5.1	4.5	5.3	2.2	2.2	2.8	3.6	1.3	4.6	5.7	3.5	1.21	6.56	7.77	2.03
Brazil	19.47	5.3	4.3	4.6	6.1	3.5	4.1	4.5	2.6	3.7	2.4	4.9	5.7	3.9	5.3	4.5	2257.42	1570.71	3828.13	196.66
Bulgaria	13.12	6.6	4.7	5.0	3.8	4.5	5.0	5.1	3.9	2.4	3.1	5.8	2.1	4.3	5.3	4.1	1.76	94.65	96.41	7.35
Burundi	0.20	3.8	3.9	1.6	2.0	3.9	4.1	4.2	1.8	1.6	2.3	1.8	1.1	2.5	4.7	2.6	0.00	1.75	1.75	8.58
Cambodia	6.69	4.0	4.1	3.6	3.2	3.7	3.3	5.1	3.5	2.1	2.4	2.9	1.6	5.1	5.1	3.3	3.70	92.03	95.74	14.31
Cameroon	2.81	3.1	4.4	2.7	3.3	4.0	4.1	4.3	1.8	1.6	2.2	2.4	1.3	2.8	5.0	2.9	2.36	53.96	56.32	20.03
Canada	104.27	5.6	5.5	5.6	4.6	5.3	4.7	6.1	3.3	6.8	4.0	6.0	4.1	4.9	4.5	5.0	1237.27	2358.44	3595.71	34.48
Cape Verde	91.63	4.7	4.5	4.0	2.1	4.4	4.4	5.2	3.2	3.5	3.1	4.6	1.1	4.6	5.2	3.6	1.72	44.15	45.87	0.50
Chad	1.08	2.9	3.1	2.0	2.7	2.9	4.2	3.7	1.7	1.5	2.0	2.0	1.0	3.1	4.9	2.5	0.00	12.45	12.45	11.53
Chile	36.93	5.2	4.8	4.9	3.3	5.0	4.1	5.7	4.7	2.7	3.3	4.4	2.7	4.6	5.3	4.1	232.92	404.78	637.70	17.27
China	11.68	5.4	5.2	4.6	5.3	4.2	3.2	5.0	3.0	4.3	4.0	3.2	6.9	4.8	5.3	4.7	11208.57	4489.14	15697.71	1344.13
Colombia	13.93	5.0	4.6	4.4	4.5	4.0	4.2	2.6	4.6	2.8	2.3	3.7	3.4	4.1	4.4	3.8	244.88	408.67	653.55	46.93
Congo-DemRp	0.53	2.8	3.9	1.6	4.1	4.1	4.0	4.0	1.5	1.6	1.8	1.9	1.4	1.9	3.8	2.6	10.60	33.91	44.51	84.10
Costa Rica	27.21	5.0	4.9	5.2	5.4	4.5	4.6	5.4	4.2	3.2	2.6	5.3	1.7	5.2	4.3	4.2	0.98	127.63	128.61	4.73
CVXte d'Ivoire	2.55	2.6	3.7	3.5	3.5	4.3	4.3	5.0	2.6	2.2	3.2	2.9	1.3	3.5	4.4	3.2	0.76	50.57	51.32	20.15
Croatia	21.58	6.4	4.4	5.0	4.5	4.0	4.7	6.1	4.2	3.0	3.9	6.3	2.8	4.5	4.4	4.4	3.92	91.12	95.04	4.40
Cyprus	145.42	5.8	4.9	4.8	2.9	4.6	4.0	5.8	3.8	3.1	3.7	5.6	1.8	5.7	4.3	4.0	0.04	162.34	162.38	1.12
Czech Republic	20.29	6.7	5.0	5.6	2.5	4.5	4.9	5.9	4.2	3.1	4.9	5.1	2.4	4.2	4.9	4.2	0.41	212.58	212.99	10.50
Denmark	91.29	6.1	5.7	6.4	3.3	5.5	5.2	6.1	4.4	3.5	5.4	4.8	2.3	4.4	3.8	4.4	16.99	491.55	508.54	5.57
Dominican Rep.	38.95	4.9	4.1	3.7	3.2	4.2	3.7	4.5	3.3	2.8	3.5	4.6	1.4	5.8	4.4	3.6	0.00	391.73	391.73	10.06
Ecuador	11.39	5.1	4.2	3.9	4.9	3.9	4.0	5.2	3.9	2.5	3.6	3.9	2.0	4.7	5.1	3.9	38.04	128.98	167.02	14.67
Egypt	7.59	5.4	4.1	3.9	2.5	4.3	4.1	3.3	2.5	2.9	3.0	3.2	3.3	5.0	6.2	3.6	25.31	601.11	626.42	82.54
El Salvador	16.31	4.9	4.2	3.7	2.4	4.0	4.1	3.0	4.5	2.1	3.0	3.3	1.5	4.3	4.8	3.3	0.00	101.57	101.57	6.23
Estonia	21.71	6.3	5.2	6.1	2.4	5.2	4.9	6.3	3.7	3.0	4.4	5.5	1.6	5.5	5.1	4.2	0.12	28.97	29.09	1.34
Ethiopia	4.03	4.5	3.7	2.6	3.0	4.0	4.2	4.9	2.6	2.0	2.8	2.2	1.7	3.6	4.9	3.1	8.46	333.06	341.52	84.73
Finland	84.28	6.3	5.6	6.2	2.9	5.7	5.4	6.7	4.1	4.0	4.6	4.7	2.1	4.6	4.3	4.4	35.29	418.85	454.13	5.39
France	59.61	6.5	5.1	5.9	4.8	4.7	4.8	5.4	4.2	4.9	5.6	5.7	6.7	5.1	4.1	5.3	338.87	3561.94	3900.82	65.43
Gabon	20.22	4.4	3.7	3.8	2.7	4.0	4.6	5.3	2.3	2.1	2.2	2.5	1.2	2.6	5.5	3.1	0.54	30.48	31.02	1.53
Gambia	5.98	3.6	4.0	3.3	2.3	4.3	4.0	5.6	2.1	1.8	3.0	2.8	1.2	4.8	5.3	3.1	0.00	10.61	10.61	1.78
Georgia	10.27	6.1	4.8	4.5	2.4	5.3	4.4	6.0	3.1	2.2	3.3	4.0	1.6	4.9	4.9	3.7	0.13	45.95	46.08	4.49
Germany	62.38	6.9	5.6	5.8	4.0	5.3	5.2	5.6	4.3	4.9	5.8	6.0	6.3	4.8	4.2	5.3	265.96	4836.83	5102.79	81.80
Ghana	4.72	3.0	4.7	3.6	2.7	4.7	4.1	5.5	1.9	2.0	2.7	2.4	1.5	3.5	4.2	3.0	5.76	112.01	117.77	24.97
Greece	55.61	6.6	4.8	4.9	4.1	4.1	4.5	5.6	4.1	4.3	3.7	5.7	3.1	5.5	4.7	4.5	54.39	574.06	628.45	11.30
Guatemala	2.97	4.6	4.1	3.8	3.7	4.5	3.8	3.7	3.9	1.9	2.7	3.7	1.6	4.4	5.6	3.5	0.76	43.11	43.87	14.76
Honduras	3.19	4.6	4.3	3.4	3.5	4.2	4.3	3.5	4.2	2.2	3.0	3.7	1.5	5.0	4.7	3.5	1.34	23.42	24.76	7.75
Hong Kong	373.44	6.6	5.4	6.5	3.5	6.2	4.3	6.5	3.9	5.5	6.4	4.4	3.0	5.8	4.2	4.9	0.00	2640.79	2640.79	7.07
Hungary	15.95	6.6	4.7	4.9	2.6	4.2	4.7	5.7	4.2	3.0	4.4	4.4	2.3	4.9	4.7	4.1	0.00	159.07	159.07	9.97
Iceland	493.84	6.1	5.8	6.1	3.5	5.3	4.8	6.6	4.4	4.7	4.0	5.8	1.5	6.0	3.6	4.5	2.18	155.36	157.54	0.32
India	3.04	4.4	4.4	3.2	4.4	4.3	3.1	4.1	3.7	3.9	4.5	2.7	5.3	3.9	5.8	4.2	1763.42	2013.80	3777.22	1241.49
Indonesia	11.84	4.3	4.6	3.8	4.7	4.5	3.2	5.1	4.3	3.8	3.2	3.1	3.3	5.6	6.0	4.2	1839.41	1030.47	2869.89	242.33
Iran-Islamic-RP	3.86	4.7	4.1	3.8	2.4	4.3	3.6	5.2	2.4	2.2	3.1	2.5	2.8	3.6	6.7	3.4	100.00	188.59	288.59	74.80
Ireland	117.31	5.7	5.5	5.7	2.8	5.5	4.7	6.1	4.5	4.2	4.7	5.8	2.9	5.4	4.0	4.5	0.65	536.20	536.86	4.58
Israel	70.73	6.1	5.2	5.5	2.6	5.0	3.9	4.6	2.5	3.2	4.2	5.4	2.0	4.6	3.1	3.8	4.29	544.98	549.27	7.77
Italy	40.42	6.2	4.6	5.4	4.8	3.9	4.5	5.4	4.1	4.4	4.7	6.0	6.5	4.5	3.9	5.0	427.49	2026.92	2454.41	60.72
Jamaica	49.14	4.7	4.7	4.2	3.0	4.8	3.6	4.0	4.0	2.4	4.4	4.6	1.4	5.9	4.0	3.7	0.10	132.89	133.00	2.71
Japan	45.54	6.4	5.2	6.1	4.3	5.3	4.4	6.1	4.4	4.6	5.4	5.3	6.5	5.4	4.6	5.3	2173.62	3646.73	5820.35	127.82
Jordan	30.59	5.5	4.5	5.1	2.3	4.8	4.0	5.8	3.3	2.6	3.0	4.1	1.3	5.3	4.8	3.6	0.60	188.49	189.09	6.18
Kazakhstan	17.05	6.7	4.8	4.9	2.6	4.9	3.8	5.5	2.3	2.6	2.8	3.1	1.6	4.3	5.9	3.6	117.75	164.60	282.35	16.56
Kenya	6.46	3.2	4.5	3.4	4.7	4.4	4.7	3.4	3.0	2.5	3.1	3.2	1.6	5.3	4.8	3.6	14.44	254.23	268.67	41.61
Korea-Rep.	49.12	6.4	4.9	6.2	2.3	4.8	4.2	5.8	4.3	4.3	5.0	4.6	4.9	4.6	4.7	4.6	197.12	2248.25	2445.37	49.78
Kuwait	102.45	5.4	4.3	5.5	1.9	4.6	3.1	5.7	1.9	2.5	3.5	3.8	1.2	3.3	5.3	3.3	0.00	288.71	288.71	2.82
Kyrgyz Rep.	13.40	5.8	4.4	3.6	2.4	4.4	3.7	5.0	2.3	1.9	2.1	2.2	1.6	3.6	5.5	3.1	4.17	69.70	73.87	5.51
Lao PDR	3.67	4.3	4.6	3.1	3.0	4.7	3.8	5.4	3.0	2.1	2.4	3.5	1.3	4.7	5.7	3.4	3.40	19.68	23.08	6.29
Latvia	36.93	6.4	5.0	5.3	2.4	4.6	4.9	5.8	4.0	3.1	4.0	4.6	1.4	4.5	5.2	4.0	0.00	76.00	76.00	2.06
Lebanon	37.87	5.9	3.8	4.3	2.1	4.2	3.7	3.6	2.5	2.4	2.9	4.3	1.4	5.0	5.5	3.4	0.00	161.31	161.31	4.26
Lesotho	0.14	2.9	3.6	3.2	2.1	4.2	4.7	5.4	1.7	1.3	1.9	2.5	1.0	4.7	5.0	2.8	0.00	0.31	0.31	2.19

Note. *Y* = PCAAWSK = A–T / Pop., *X*1 = Health & Hygiene, *X*2 = Human Resources & Labor Market, *X*3 = ICT Readiness, *X*4 = Natural Resources, *X*5 = Business Environment, *X*6 = Environmental Sustainability, *X*7 = Safety & Security, *X*8 = International Openness, *X*9 = Air Transport Infrastructure, *X*10 = Ground & Port Infrastructure, *X*11 = Tourist Service Infrastructure, *X*12 = Cultural Resources, *X*13 = Prioritization of T&T, *X*14 = Price Competitiveness, TTCI = Travel and Tourism Competitiveness Index, A-D = Annual Average Weekly Available Seat Kilometers-Domestic, A–I = Annual Average Weekly Available Seat Kilometers-International, A–T = (A–D) + (A–I), Pop. = Population.

Table A.1

Raw Data (Continued)

Countries	*Y*	*X*1	*X*2	*X*3	*X*4	*X*5	*X*6	*X*7	*X*8	*X*9	*X*10	*X*11	*X*12	*X*13	*X*14	TTCI	A-D	A-I	A-T	Pop.
Lithuania	20.71	6.8	5.0	5.5	2.2	4.6	4.4	5.7	4.0	2.4	4.4	4.4	1.5	4.3	5.4	3.9	0.00	62.77	62.77	3.03
Luxembourg	62.88	6.3	5.3	6.2	2.7	5.8	5.5	6.3	4.3	3.6	5.5	5.9	1.7	4.8	4.6	4.5	0.00	32.59	32.59	0.52
Macedonia	9.81	6.0	4.4	4.6	2.1	4.8	3.7	5.6	2.6	2.2	3.3	4.0	1.4	4.3	5.2	3.5	0.00	20.24	20.24	2.06
Madagascar	1.80	3.3	3.8	2.1	3.1	3.6	3.6	5.0	3.0	1.8	2.0	2.7	1.4	4.4	5.0	3.0	4.53	33.89	38.42	21.32
Malawi	0.55	3.0	4.2	2.5	2.9	4.2	4.2	5.4	2.8	1.4	2.1	2.2	1.3	3.4	4.6	2.9	0.00	8.40	8.40	15.38
Malaysia	67.13	5.2	5.2	5.2	4.1	5.4	3.5	5.8	4.1	4.5	4.4	4.7	2.9	4.7	6.1	4.5	456.53	1480.74	1937.26	28.86
Mali	2.13	2.6	3.1	2.4	2.5	4.1	4.3	3.6	1.6	1.7	2.3	2.6	1.8	3.8	5.0	2.8	0.00	33.80	33.80	15.84
Malta	200.60	6.4	4.8	5.4	3.1	4.8	4.1	5.9	4.0	3.9	4.5	5.5	1.5	6.2	4.4	4.3	0.00	83.38	83.38	0.42
Mauritania	3.25	3.7	2.6	2.2	2.3	3.4	3.7	4.2	2.9	1.6	2.0	2.4	1.1	3.2	4.8	2.6	1.05	10.47	11.52	3.54
Mauritius	140.76	5.3	4.8	4.5	2.4	5.2	4.3	5.9	3.5	3.0	4.5	4.9	1.3	6.0	4.1	3.9	2.24	178.78	181.03	1.29
Mexico	18.39	5.3	4.6	4.3	5.6	4.2	3.6	4.2	3.7	3.7	3.2	4.7	5.3	5.1	4.9	4.5	884.06	1226.74	2110.80	114.79
Moldova	9.22	6.1	4.3	4.3	1.6	3.8	4.1	5.4	2.1	2.0	2.5	2.8	1.2	3.4	5.4	3.1	0.00	32.82	32.82	3.56
Mongolia	9.52	5.8	4.5	4.0	2.7	4.4	3.4	5.7	1.9	2.2	2.1	2.7	1.8	4.0	5.7	3.3	2.40	24.25	26.65	2.80
Montenegro	32.22	5.8	4.5	4.8	2.6	4.4	4.3	5.4	2.4	3.0	3.2	5.4	1.1	4.6	4.8	3.7	0.00	20.37	20.37	0.63
Morocco	14.36	4.6	3.9	4.3	3.6	4.7	3.7	6.1	2.7	2.8	3.4	3.8	2.5	5.0	5.2	3.8	8.36	455.22	463.58	32.27
Mozambique	1.68	1.8	3.6	2.6	2.9	4.2	4.2	4.6	3.1	1.8	2.1	2.8	1.3	4.0	4.6	2.9	18.62	21.50	40.11	23.93
Namibia	15.10	3.5	4.1	3.9	3.8	4.9	3.9	5.2	2.7	3.0	3.2	4.0	1.2	4.6	5.4	3.6	1.31	33.78	35.09	2.32
Nepal	3.55	5.0	4.2	2.6	4.2	4.1	3.4	4.8	2.8	2.0	1.9	2.3	1.3	4.8	5.6	3.3	5.42	102.74	108.16	30.49
Netherlands	112.68	6.2	5.5	6.1	2.2	5.5	5.1	6.1	4.3	5.0	6.1	4.9	3.4	4.7	4.1	4.6	0.19	1880.71	1880.90	16.69
New Zealand	173.23	5.7	5.5	6.0	4.5	5.7	4.7	6.3	4.5	4.7	3.7	5.7	2.3	5.6	4.4	4.7	140.86	622.24	763.10	4.41
Nicaragua	3.86	4.6	4.2	3.3	3.3	3.5	4.0	5.4	4.3	2.0	2.7	3.5	1.4	4.6	5.1	3.4	0.00	22.66	22.66	5.87
Nigeria	1.95	2.7	3.6	3.2	2.4	4.3	3.9	3.1	1.9	2.0	2.1	2.7	1.9	3.2	4.9	2.8	61.03	255.58	316.61	162.47
Norway	123.35	6.3	5.6	6.3	4.1	5.6	5.6	6.4	4.0	5.3	3.5	5.4	2.2	5.2	3.7	4.6	209.65	401.31	610.96	4.95
Oman	96.19	5.4	4.1	5.1	2.6	5.1	3.7	6.5	2.2	3.0	3.9	4.1	1.9	4.4	5.5	3.8	13.75	260.03	273.77	2.85
Pakistan	2.57	4.5	3.1	2.5	2.2	3.9	3.1	3.1	2.2	2.1	3.0	2.3	1.9	3.4	5.4	2.9	74.69	379.28	453.97	176.75
Panama	116.93	5.1	4.4	4.5	4.6	4.9	4.6	5.3	4.4	4.7	4.2	4.9	1.7	5.1	5.2	4.4	2.82	414.77	417.58	3.57
Paraguay	4.00	5.0	4.1	3.7	2.3	4.3	3.8	4.7	2.5	1.6	2.1	3.3	1.4	4.9	5.0	3.1	0.40	25.90	26.30	6.57
Peru	18.68	4.8	4.7	4.2	5.3	4.3	4.1	4.5	4.3	2.5	2.4	4.7	3.3	4.6	3.8	4.0	155.43	393.61	549.04	29.40
Philippines	12.74	4.8	4.8	4.0	4.0	4.3	3.6	3.6	3.4	2.7	2.5	3.4	1.9	4.8	5.5	3.6	329.04	878.93	1207.97	94.85
Poland	9.90	6.2	4.9	5.1	3.0	4.5	4.6	5.7	4.1	2.6	4.3	4.2	2.8	4.1	5.5	4.1	12.26	369.24	381.50	38.53
Portugal	79.72	6.3	5.2	5.2	3.9	4.6	4.3	6.3	4.2	3.9	4.2	6.4	3.9	5.5	4.8	4.7	71.23	770.39	841.62	10.56
Qatar	751.19	6.0	5.2	5.8	1.8	5.8	4.1	6.3	2.0	4.3	4.7	5.0	1.6	4.5	5.7	4.1	0.00	1404.75	1404.75	1.87
Romania	10.21	6.1	4.4	4.7	3.0	4.4	4.4	5.8	3.9	2.4	2.8	4.4	2.3	3.8	4.7	3.8	5.23	213.06	218.30	21.38
Russian Fed.	25.05	6.7	4.8	5.0	3.8	4.1	4.1	4.3	2.2	4.5	3.0	4.5	3.2	4.2	5.8	4.2	2014.28	1567.13	3581.41	142.96
Rwanda	2.49	3.8	4.7	3.3	2.7	5.1	4.8	6.4	2.9	1.9	3.5	2.4	1.3	4.3	4.8	3.4	0.16	27.12	27.29	10.94
Saudi Arabia	56.25	5.6	4.6	5.6	2.5	5.2	3.5	5.5	1.6	3.7	3.3	4.7	2.2	4.4	5.6	3.8	344.33	1235.43	1579.76	28.08
Senegal	6.85	3.6	3.6	3.2	3.4	4.2	4.3	5.4	2.5	2.0	2.9	3.1	1.4	3.3	3.7	3.1	0.24	87.24	87.47	12.77
Serbia	10.43	6.0	4.4	4.8	2.0	4.0	4.2	5.4	2.4	2.4	2.8	3.9	1.7	3.6	4.8	3.4	0.00	75.73	75.73	7.26
Sierra Leone	1.09	2.3	4.2	2.3	2.3	4.2	4.0	5.1	1.8	1.5	2.3	1.9	1.3	3.6	4.5	2.7	0.00	6.55	6.55	6.00
Singapore	455.99	5.5	5.6	6.1	2.4	6.1	4.3	6.5	5.2	5.3	6.3	5.4	3.1	6.0	4.7	4.9	0.00	2363.72	2363.72	5.18
Slovak Rep.	4.92	6.5	4.7	5.4	3.4	4.0	4.8	5.6	3.9	1.7	4.2	4.3	1.5	4.1	5.0	3.9	0.18	26.36	26.54	5.40
Slovenia	9.42	6.0	4.9	5.2	3.8	4.3	5.1	6.2	3.7	2.5	4.8	5.4	1.5	4.8	4.6	4.2	0.00	19.33	19.33	2.05
South Africa	23.56	3.8	4.6	4.4	4.4	5.3	3.6	3.9	2.4	3.4	3.4	4.4	3.4	4.7	5.2	4.0	324.77	866.94	1191.70	50.59
Spain	81.40	6.3	4.9	5.5	4.9	4.4	4.6	6.2	3.9	5.0	5.2	6.7	6.9	5.9	4.5	5.4	514.59	3244.04	3758.63	46.17
Sri Lanka	15.26	5.3	4.5	3.7	4.1	4.7	3.9	5.5	3.1	2.6	3.9	3.2	1.6	5.2	5.6	3.8	0.19	318.36	318.54	20.87
Sweden	60.44	6.1	5.5	6.3	3.1	5.5	5.3	6.2	4.1	4.6	4.6	5.0	3.0	4.6	4.0	4.6	104.96	466.19	571.15	9.45
Switzerland	127.00	6.5	5.7	6.4	3.7	6.0	5.8	6.4	4.1	4.9	5.9	6.2	2.9	5.6	2.8	4.9	5.62	999.26	1004.89	7.91
Taiwan-China	54.46	6.1	5.3	5.5	3.4	5.2	4.1	6.0	4.2	3.5	5.2	4.5	3.2	4.7	5.2	4.5	11.04	1253.63	1264.67	23.22
Tajikistan	9.52	5.7	4.9	2.3	2.7	4.3	4.0	5.7	2.6	2.2	2.6	2.1	1.3	4.0	4.7	3.2	0.21	66.67	66.88	7.03
Tanzania	2.32	2.9	3.6	2.7	4.9	4.2	4.2	5.1	3.2	2.0	2.6	2.9	1.5	4.8	5.4	3.4	17.12	90.32	107.44	46.22
Thailand	41.72	4.9	4.9	4.8	4.9	4.7	3.6	4.0	3.8	4.6	3.1	5.8	2.8	5.0	5.6	4.4	474.76	2425.84	2900.59	69.52
Trini & Tobago	54.70	5.1	4.5	4.8	2.7	4.4	3.8	4.1	3.5	4.1	4.2	4.1	1.3	3.7	4.8	3.7	1.71	62.61	64.32	1.18
Tunisia	11.68	5.2	4.0	4.3	2.5	4.5	3.9	4.7	3.0	2.3	2.7	4.1	1.5	4.8	5.9	3.5	1.63	123.01	124.64	10.67
Turkey	37.00	5.4	4.3	4.3	3.0	4.5	3.7	4.1	3.9	4.7	3.5	4.7	4.1	4.3	4.9	4.1	673.01	2051.60	2724.61	73.64
Uganda	1.48	2.8	4.0	2.8	3.7	4.3	4.3	4.6	3.0	1.8	2.3	3.0	1.6	4.1	5.0	3.2	0.15	50.79	50.94	34.51
Ukraine	5.46	6.6	4.9	4.2	2.3	3.7	3.9	3.5	2.9	2.4	3.0	4.0	2.1	4.3	5.2	3.5	7.01	242.50	249.52	45.71
United Arab Em	692.17	5.4	5.2	6.1	2.6	5.9	4.5	6.6	3.0	5.8	4.9	5.4	2.2	5.1	5.0	4.5	0.22	5461.65	5461.87	7.89
United King.	102.53	5.8	5.5	6.2	4.6	5.9	4.7	5.3	4.2	5.2	5.4	6.2	6.0	5.0	2.8	5.2	238.32	6195.11	6433.43	62.74
United States	114.92	5.7	5.5	6.0	4.9	5.4	3.6	5.2	4.0	6.0	4.6	6.6	4.8	5.3	4.4	5.1	22812.25	12994.45	35806.69	311.59
Uruguay	18.15	6.0	4.6	5.5	2.5	4.6	3.9	5.5	2.7	2.1	2.8	4.4	1.8	5.3	4.0	3.6	0.00	61.14	61.14	3.37
Venezuela	6.13	5.1	3.9	3.5	4.6	2.4	3.7	3.3	2.2	2.0	2.0	3.1	2.2	3.4	5.5	3.3	64.48	115.01	179.50	29.28
Vietnam	10.84	5.0	4.9	4.2	4.0	4.5	3.4	5.6	3.0	2.8	3.1	2.6	3.0	4.0	5.3	3.8	407.39	545.11	952.50	87.84
Yemen	1.39	3.8	3.2	2.3	1.9	3.5	2.8	2.8	1.3	1.5	2.0	2.2	1.3	2.4	5.9	2.4	3.03	31.52	34.55	24.80
Zambia	2.44	2.7	4.1	2.8	3.7	4.6	4.6	5.4	2.9	1.9	2.3	2.6	1.3	3.9	4.8	3.2	1.26	31.67	32.93	13.48
Zimbabwe	1.68	2.9	3.6	2.9	3.6	3.0	4.1	5.5	2.9	1.9	2.4	2.8	1.5	3.9	5.1	3.1	2.43	19.06	21.49	12.75

Note. *Y* = PCAAWSK = A–T / Pop., *X*1 = Health & Hygiene, *X*2 = Human Resources & Labor Market, *X*3 = ICT Readiness, *X*4 = Natural Resources, *X*5 = Business Environment, *X*6 = Environmental Sustainability, *X*7 = Safety & Security, *X*8 = International Openness, *X*9 = Air Transport Infrastructure, *X*10 = Ground & Port Infrastructure, *X*11 = Tourist Service Infrastructure, *X*12 = Cultural Resources, *X*13 = Prioritization of T&T, *X*14 = Price Competitiveness, TTCI = Travel and Tourism Competitiveness Index, A-D = Annual Average Weekly Available Seat Kilometers-Domestic, A–I = Annual Average Weekly Available Seat Kilometers-International, A–T = (A–D) + (A–I), Pop. = Population.