



RELATION BETWEEN INVESTMENT TRADE AND TOURISM

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Abstract: According to recent research, international commerce and tourism are interconnected and may affect one another. Using a method rooted in the network sciences, this research explores the connection between international tourist and international commercial flows. In this study, we use a weighted directed network model to investigate the similarities between data on bilateral trade-exports and data on international visitors. The actual data demonstrates a high degree of consistency between commerce and tourist networks, both in terms of weighted degree correlation and Page Rank. Using measurements from the field of network sciences, this research demonstrates this connection.

KEYWORDS - Tourism, Trade, Trade-Exports

I. INTRODUCTION

The rise of modern digital technology has had an impact on almost every industry, and The vast majority of the systems we study today are complex, non-trivial systems with numerous individual components that each play an important part in the whole. In addition, the behavior of such systems cannot be understood by considering just its individual components. Systems having these features are often referred to as "com-plex" in the literature. In order to understand complicated systems, researchers first had to figure out how they were put together.

Graphs represent important ideas in the study of complex systems. Graph representations of complicated systems allow us to use well-established and well-understood techniques from graph theory. According to the National Research Council, "network science" is "the study of network representations of physical, biological, and social phenomena leading to predictive models of these phenomena.

Social networks, economic networks, transportation networks, epidemic transmission metabolic networks and the World Wide Web are only some of the many systems that have been represented by the phrase "complex network." Several novel network models have been presented and codified during the last few years, thanks in large part to the growing interest in complex networks and the great gains in computer power. Several real-world networks were shown to be non-random by these simulations.

The term "small-world" was used by Watts and Strogatz to characterize a crucial metric in networks. Each node in a network with the small-world attribute may reach every other node in the network with a very short number of hops, and the network also displays the trait of a high clustering coefficient. Barabbas et al. -also noticed an intriguing feature they dubbed "scale-free." It is associated with the degree distributions of the networks following a power law. In an experiment that mimicked the structure of the Internet, they demonstrated that the Web-like networks do not suffer from the scaling problems that plague other similar systems. In this research, we use sophisticated network ideas to examine the connection between international tourist and international commerce.

Trade between nations is not a new idea, but the last several decades have highlighted its economic, social, and political significance. Several researchers have looked at the possible links between international commerce and macroeconomics, exchange rates, and the transmission of financial crises. During the last several decades, global travel has gotten much more convenient, swifter, and less expensive. With its rapid growth and diversification over the last 60 years, the tourist sector has had a profound effect on the global economy.

In 2018, foreign visitor arrivals totaled 983 million, up from 940 million in 2019, as reported by the United Nations World Tourism Organization (UNWTO). Tourism is a vital industry for many developing nations because it generates much-needed foreign currency, leads most export sectors, and provides both immediate and long-term benefits in the form of jobs and new possibilities. In 2017, the tourism sector worldwide contributed US\$2 trillion directly to the global economy and employed 98 million people². Countries that were more receptive to free trade agreements saw an increase in both international commerce and tourism. When it comes to a country's balance of payment accounts, international commerce and tourism play comparable roles.

LITERATURE REVIEW

In the beginning, the positional closeness in the trade network was evaluated using network analysis. In 1979, a groundbreaking essay was published that made the first direct effort to apply the network method to analyze the global economic system. By using block modeling, Snyder and Kick were able to explain the dynamic trade interaction between 118 nations in the global system. They mainly concerned themselves with dividing the world's nations into three categories: core, semi-core, and peripheral. Their research suggests that OECD nations are representative of the established international order.

Their extensive study paved the way for several following studies on the same issue. **Nemeth and Smith 2018** developed the core-periphery model to portray nations in structural positions based on flows differentiated across five categories of globally traded commodities. Whereas Snyder and Kick ranked countries according to their commerce, military interventions, treaty memberships, and diplomatic interactions, Nemeth and Smith classified them simply according to their trade networks and unequal exchange. They found that the dependence ideas held water by classifying 89 nations into four distinct structural situations.

A classic paper on the topic of WTN analysis was written by **Smith and White 2017**. They use dynamic analysis over three years to examine WTN development utilizing a core-periphery framework. Prior research only looked at one instant in time. They confirmed the growth of core countries through time, followed the shifting positions of individual countries, and saw the continual marginalization of periphery nations using a dynamic modeling technique.

Similar research by **Fagiolo et 2019** used a weighted network technique to look for similarities in wealth and social structure across nations. They also support the claim that better WTN rankings translate to more economic development for a country. Network analysis has also been used to delve into the issue of whether or not regionalization facilitates or hinders globalization, alongside research focusing on the core-periphery framework. To other observers, regionalization is only a temporary strategy that certain nations use to boost their competitiveness in the globalized market, and they think that in the long run, it will actually help to further globalization.

Others argue that regionalization is counterproductive to globalization since it reduces the well-being of non-member nations and encourages inefficient manufacturing practices that may succeed locally but fail internationally. Both the density of the network of nations and the distribution of degrees at individual nodes are seen to have risen over time, a trend that Kim and Shin attribute to the spread of globalization. Also, there seems to be an uneven distribution of newly acquired connections. Connections are often made outward from the center, and inward to the periphery, from the nations. **Kastelle 2018**.

To illustrate the relationship between countries, they have used an unweighted undirected network technique, which may not be the best strategy given that taking edge weights into account might provide fruitful insights. Similar to how understanding inflow and outflow patterns requires directed network analysis. In this research, we compare the global commerce network to the global tourist

network to see whether there are any commonalities in their overall structure and patterns of traffic flow. As part of our research, we use edge weights to construct directed trade and tourism networks based on the bilateral global data of 204 and 229 nations, respectively.

RESEARCH METHODOLOGY

Methods for data collection

Primary Data

Secondary Data

Primary Data

Primary source of data was collected by questionnaire.

Secondary Data

Secondary source of data was collected from

Books

Journals

Magazines

Web's big data es

Plan of analysis

- Diagrammatic representation through graphs and charts
- Big data able inferences will be made after applying necessary statistical tools.
- Findings & suggestions will be given to make the study more useful.

HYPOTHESIS

H0: There is a significant different between relation between investment trade and tourism

H1: There is no significant different between relation between investment trade and tourism.

$$\chi^2 = \frac{(61-47)^2}{47} + \frac{(39-53)^2}{53} = 7.868$$

47 53

$$P\text{-value} = 1 - p(\chi^2(1) \leq 7.868).$$

k	2	Number of categories
n	100	Sample size
χ^2	7.868326	Chi square test statistic
DF	1	df = k-m-1 = 2-0-1 = 1
Phi effect (Φ)	0.280505	$\Phi = \sqrt{\chi^2/n}$

Goodness of fit, using χ^2 distribution

1. H0 hypothesis

The null hypothesis (H0) is rejected due to the small p-value.

It is clear that the data do not match the statistical model.

A second P-value

The significance level is 0.95% ($p(x2) = 0.005031$). This indicates that there is only a 5% chance of making a type I error (by rejecting a true H0).

A lower p-value indicates stronger support for H1.

Thirdly, the numbers

The 2 value of 7.8683 is outside the 95% confidence interval. $[-\infty : 3.8415]$.

Amount of Influence

The magnitude of the measured effect, phi, is moderate, at 0.28.

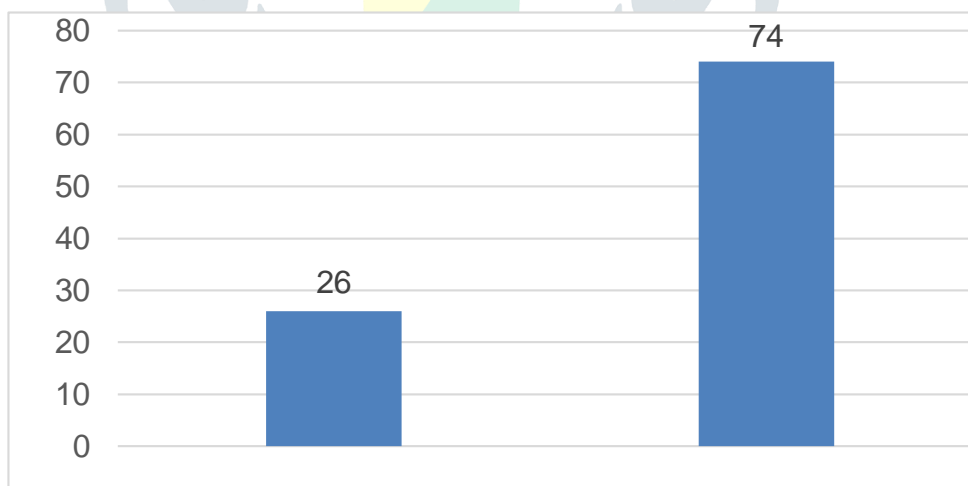
That's a pretty good indicator that the gap between the two sets of numbers isn't too wide.

DATA ANALYSIS AND INTERPRETATION

1. Respondents are divided by their marital status.

Table No: 6. 1

Marital Status	No of Respondents	Percentage
Married	26	26
Unmarried	74	74
Total	100	100



Graph 6.1

INTERPRETATION:

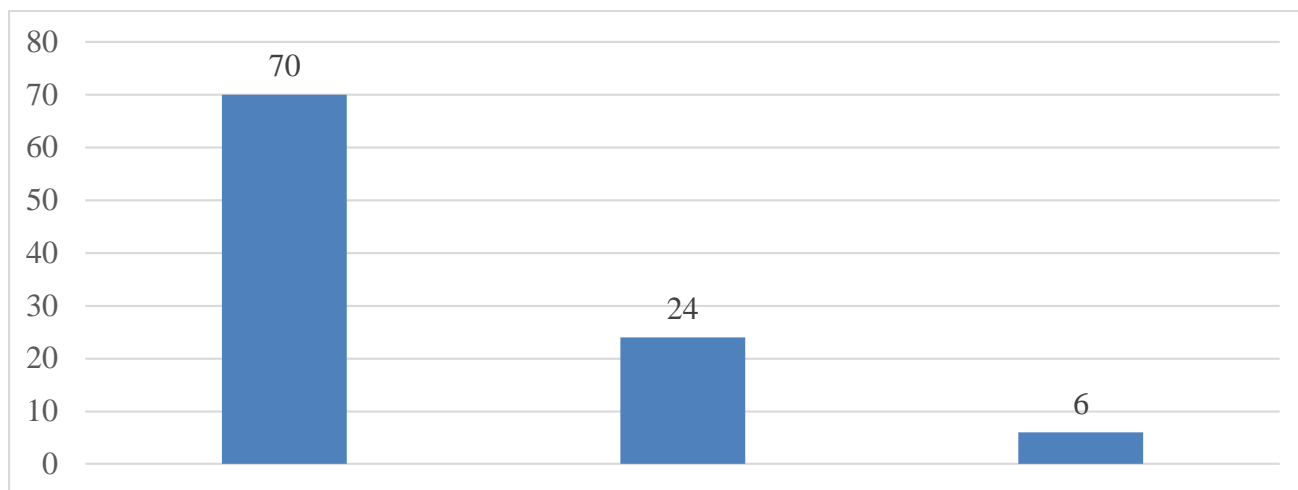
According to the data shown above, the marital status of the sample is 26%, while the single status of the sample is 74%. The results of the study suggest that the vast majority of its participants are single.

2. Respondents are divided into age groups for classification purposes.

Table No: 6.2:

Age group	No of Respondents	Percentage
Below 25	70	70
Between 26-35	24	24
Above 36	6	6
Total	100	100

Graph 6.2



INTERPRETATION

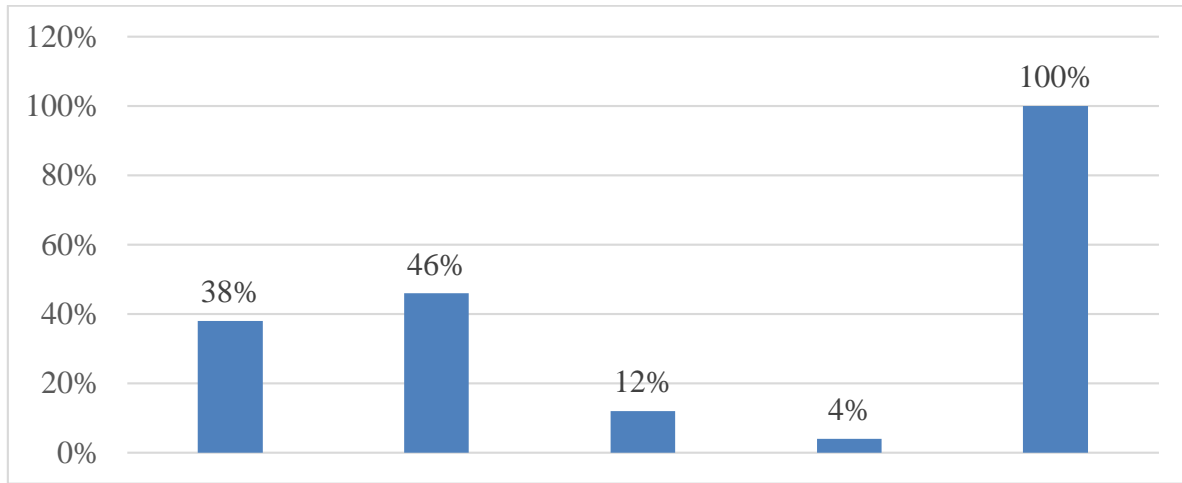
According to the data shown in the table and the graph above, 70.0 percent of the respondents are younger than 25 years old, 24.0 percent are between the ages of 26 and 35.0 years old, and 6.0 percent are older than 36 years old.

3. People who have responded based on their own personal experiences

Table 6.3

Experience	No. of respondent	Percentage (%)
0-4	38	38%
4-8	46	46%
8-12	12	12%
Above 12	4	4%
Total	100	100%

Graph 6.3.



INTERPRETATION

Approximately 38% of those with 0-4 years of experience and 46% of those with 4-8 years of experience have a significant impact on the structure of both these expert groups, as seen in the chart above. groups.

RECOMMENDATION

To determine whether or not international commerce and tourism are related, we propose using network science analysis. Given that some of the techniques outlined here can be used to find some structural similarity between these two global networks, this may be taken as a sign that there are further similarities that can be exposed via further network research.

RESULTS AND FINDINGS

- According to the data shown above, the marital status of the sample is 26%, while the single status of the sample is 74%. The results of the study suggest that the vast majority of its participants are single.
- According to the data shown in the table and the graph above, 70.0 percent of the respondents are younger than 25 years old, 24.0 percent are between the ages of 26 and 35.0 years old, and 6.0 percent are older than 36 years old.
- Approximately 38% of those with 0-4 years of experience and 46% of those with 4-8 years of experience have a significant impact on the structure of both these expert groups, as seen in the chart above. groups.

CONCLUSION

We propose that network science analysis may help us understand whether or not there is a connection between international commerce and tourism. Given that some of the techniques outlined here are able to uncover some structural similarity between these two global networks, this may serve as a signal that there are other similarities-ties between the networks that may be exposed via more in-depth network research. The experimental findings demonstrate a strong relationship between global commerce and tourist networks. Furthermore, the significant correlation seen in the four-way weighted in-degree and out-degree connection between both networks provides support for our hypothesis of a similar pattern.

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