A Simultaneous Equation Model Of FDI In Tourism, Tourism Growth And Poverty: Development Of Model Specification

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Abstract: Foreign direct investment (FDI) inflows are used to address the economic problems, such as poverty and tourism growth. This paper has identified, after visualizing theoretical standpoints and empirical researches, that there is the linkage between FDI inflows and poverty-GDP nexus focusing on tourism sector. Contrasting with previous studies, this study not only observed the degree of the association between FDI in tourism sector (FDIT) and poverty (POV) but also investigated the relationship between FDIT and tourism growth (TG). While the amount of literature on FDIT, TG and POV using panel data and for singular countries has increased in the last few years, no research has identified the relationships among FDIT, TG and POV together using a growth framework and a simultaneous equation model. The end discussions show that FDIT has bidirectional causal relationships with TG and POV. Therefore, reviewing this chapter it gets confirmed that the research gap prevails in this particular area, that is, neither do a research conducted for evaluation of FDI inflows in tourism impact on poverty and GDP. Thus, in the light of suggestion of theories and empirical literature, this chapter paves the ground of building up a conceptual framework that is to describe the directions in recognizing how FDI inflows in tourism can reduce poverty and stimulate the economic growth and tourism growth.

Index Terms: Tourism Growth, Poverty, FDI in Tourism Inflows, Dynamic Simultaneous Equation Model

1 INTRODUCTION

Travel and Tourism industry can be considered as the world's largest industry due of high contribution to Gross Domestic Product (GDP) worldwide which contribute up to 8.27 trillion U.S dollar by year 2017 (Yao, 2017). Plus, World Travel and Tourism Council (WTTC) also claimed that travel and tourism industry is an industry that employed more than 118 million of people worldwide in year 2017. Besides, WTTC briefly explained that travel and tourism industry managed to increase the growth rate in 2017 by only 3.8% due of world's political and economic condition that not really stable. Despite the plethora of studies on poverty (POV), tourism growth (TG) and FDI, the empirical evidence is not clear about these factors in the tourism sectors. Following criticisms of the traditional assumption of a one-way causal link between FDI and growth, recent studies have considered the possibility of two-way (bidirectional) or non-existent causality among these variables [4]. In other words, these studies have proposed that: (1) not only can FDI inflows in Tourism (FDIT) influence poverty (POV) and tourism growth (TG) but poverty and tourism growth can also cause FDI inflows in tourism; or (2) there are no causal links among the three variables. Although a number of economic theories point to a positive relationship between FDI and poverty, the direction of causality between the variables has continued to generate controversy among economists, especially regarding determining whether poverty can cause FDI inflows [10]. Additionally, few studies have tested all these constructs (FDI inflows in tourism, poverty and tourism growth) in a single model.

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2 RESEARCH OBJECTIVES

To develop simultaneous equation model and to observe the three-way linkage interrelationship between FDI in tourism, tourism growth and poverty.

3 METHODOLOGY

Justification of Variables

FDI inflows - is often associated with increased international trade and therefore has an impact on the economics of the host economy. Liu et al (2002) tested the existence of long-term relationships among economic growth, FDI and trade in China. The research found the existence of bi-directional causal relationships of FDI with growth and exports. The results similar with research from Gerlach and Liu (2010). In addition, Borensztein, De Gregorio and Lee (1998), Balasubramanyam (2001) and Xu (2000) found that FDI contributes more to POV reduction than domestic investment does. Thus, this study proposed that TG and POV levels are significantly affected by FDIT.

Tourism growth - Many researchers have agreed that growth is the single most important factor in reducing POV on a national level. As growth increases, this leads to an increase in the number of jobs, which in turn leads to a decrease in POV (Lin, Thirtle & Wiggins, 2001; Soumaré & Gohou, 2009). Sectorial growth is a key factor in increasing FDI inflows and reducing POV. Thus, as TG increases, FDIT increases and hence POV decreases.

Poverty (POV) - is a complex phenomenon. It is usually defined in relation to income and often measured in terms of GDP per capita. The higher the POV level, the less FDI inflows can be attracted. In other words, for this research there is a negative correlation between POV and FDIT.

Trade openness - is a key factor in reducing poverty. In this case, Trade openness of tourism sector (TOT) leads to better domestic technology, more-efficient production and

improved TG, leading to FDIT increases and thus POV reduction.

Market size - is defined as the level of development of a market, usually measured by per capita GDP. Generally speaking, the larger the tourism market size (MST), the more FDI inflows it attracts. In this study, the tourism per capita share of GDP was used as a proxy for MST, which is an important determinant of FDI inflows. FDIT increases TG and can reduce the POV levels.

Human capital - In endogenous growth theory, human capital has been recognized as an essential determinant of economic growth. Mankiw et al. (1992), Barro and Sala-i-Martin (2004) and Benhabib and Spiegel (1994) stressed the importance of human capital to growth in both developed and developing countries. Easterlin (1981) and Benhabib and Spiegel (1994) pointed out that human capital is a factor affecting productivity growth, as suggested by endogenous growth theory. The present study used school enrolment as a proxy for human capital. It has been commonly proven that highly educated and skilled workers enhance the absolute value of GDP. Furthermore, a higher level of education in a country attracts more investors; therefore, it indirectly contributes to economic growth. Thus, when the human capital of tourism sector (HCT) in a country increases, it leads to increased growth in tourism sectors which improves living standards, increases FDIT and decreases POV.

Unemployment Rate - Many researchers have agreed that unemployment rate (UR) is a key determinant of POV and economic growth. Minsky (1968) summarizes that the alleviation of POV can be done through the accomplishment and sustaining of full employment. Indeed, a recent study on investment showed that FDI inflows might directly increase the employment rate and training of the labour force, resulting in POV reduction in the host country (Nguyen, 2003). Thus, UR was used to understand the relationship between POV and AG.

Table 3.1
Variable definitions

Variable	Abbreviation	Unit of Measurement	Sources
Poverty level	POV	Poverty headcount ratio at national poverty lines	World Bank, UNCTAD, OIC annual reports, FAOSTAT and Thomson Reuters DataStream Professional
Tourism growth	TG	GDP tourism growth (annual %)	
FDI inflows in tourism	FDIT	Total net inflows in USD	
Tourism trade openness	TOT	Trade in tourism (% of GDP)	
Tourism human capital	HCT	Enrolment at least in higher education of tourism sector (%)	
Tourism market size	MST	Tourism value added (constant USD)	
Unemployment rate	UR	Unemployment rate	

Time-series cross-sectional (TSCS) data was employed to determine the impact of FDIA on AG and POV. A TSCS research design is considered excellent (Lempert, 1966). TSCS research designs have a number of distinct advantages, such as the potential to identify causal relationships. Furthermore, Stimson (1985) stated that the TSCS framework is one of the best models for the study of causality. According to Arellano and Bond (1995), the GMM estimator provides a convenient framework for obtaining asymptotically efficient estimators in this context. The GMM estimator is designed for datasets that have many panels and few periods and gives consistent estimates under the assumption that there is no autocorrelation in the idiosyncratic errors and that the explanatory variables are weakly exogenous. The identifying assumption that there is no serial correlation in the idiosyncratic errors can also be validated by testing for no second-order serial correlation in the first-differenced residuals. Negative first-order serial correlation is expected in the first-differenced residuals if the idiosyncratic errors are serially uncorrelated, while positive serial correlation is expected at the residual level (Bond & Windmeijer, 2002). The first model in this study was to investigate the role of tourism growth and poverty to aid FDI inflows in tourism. Thus, this research depended on the Cobb–Douglas production function. First, the model was constructed by the famous Cobb–Douglas production function:

FDI in Toursim Model

$$LogFDIT_{i,t} = \alpha_0 + LogFDIT_{i,t-1} + \alpha_1\, LogTOT_{i,t} + \alpha_2\, LogMST_{i,t} + \beta_1\, LogPOV_{i,t} + \beta_2\, LogUR_{i,t} + \beta_3\, LogHCT_{i,t} + \gamma\, LogTG_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (1)$$

where:
FDIT = FDI inflows in tourism (USD)
TOT = Tourism trade openness (% of GDP)
MST = Tourism market size (constant USD)
POV = Poverty (headcount ratio)
UR = Unemployment rate (%)
HCT = Tourism human capital (%)
TG = Tourism growth (annual %)
i = Country ;
t = Time period
$\alpha_1, \alpha_2, \beta_1, \beta_2, \beta_3$ and γ= coefficients of the independent variables
μ = is the error term

The second model in this study was to determine the impact of FDIT on TG, as referenced by Solow (1957), using the Cobb–Douglas tourism production function. This model is based on the assumptions of growth theory as specified by Solow (1957), Romer (1990) and Mankiw, et al. (1992) and as employed by Borensztein et al. (1998), Ayanwale (2007) and Goss et al. (2007). For the purpose of empirical analyses, Equation [2] was further adjusted by proxying all functions into the equations. Hence, further developing the concept of the impact of FDIT on TG, Equation [2] is similar to the equations modified by Lin, Thirtle and Wiggins (2001), Li and Liu (2005) and Licai et al. (2010).

Tourism Growth Model

$$LogTG_{i,t} = \alpha_0 + LogTG_{i,t-1} + \alpha_1 LogTOT_{i,t} + \alpha_2 LogMST_{i,t} + \beta_1 LogPOV_{i,t} + \beta_2 LogUR_{i,t} + \beta_3 LogHCT_{i,t} + \gamma LogFDIT_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (2)$$

where:
FDIT = FDI inflows in tourism (USD)
TOT = Tourism trade openness (% of GDP)
MST = Tourism market size (constant USD)
POV = Poverty (headcount ratio)
UR = Unemployment rate (%)
HCT = Tourism human capital (%)
TG = Tourism growth (annual %)
i = Country ;
t = Time period
α_1,α_(2,) β_(1,) β_(2,) β_3 and γ= coefficients of the independent variables
μ = is the error term

Equation [3] suggests that FDIA and other variables can potentially determine POV reduction (Bruno & Easterly, 1998; Nguyen, 2003, Sachs, 2005; Ang, 2008; Menyah & Wolde-Rufael, 2010; Sharma, 2010; Anwar & Sun, 2011). The following regression model was adapted from the Keynesian framework, and Equation [3] was further adjusted according to Pervez and Rizvi's (2014) conceptual framework, focusing on the tourism sector. Equation [3] shows that FDI inflows, economic growth and other controllable variables can potentially determine poverty reduction, as determined by Keynesian and liberal theory and many researchers (Bruno & Easterly, 1998, Ang, 2008, Menyah & Wolde-Rufael, 2010, Sharma, 2010; Anwar & Sun, 2011). The choice of these variables was based on their potential relevance and the relative importance of POV to tourism sectors.

Poverty Model

$$LogPOV_{i,t} = \alpha_0 + LogPOV_{i,t-1} + \alpha_1 LogTOT_{i,t} + \alpha_2 LogMST_{i,t} + \beta_1 LogTG_{i,t} + \beta_2 LogUR_{i,t} + \beta_3 LogHCT_{i,t} + \gamma LogFDIT_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (3)$$

where:
FDIT = FDI inflows in tourism (USD)
TOT = Tourism trade openness (% of GDP)
MST = Tourism market size (constant USD)
POV = Poverty (headcount ratio)
UR = Unemployment rate (%)
HCT = Tourism human capital (%)
TG = Tourism growth (annual %)
i = Country ;
t = Time period
$\alpha_1, \alpha_2, \beta_1, \beta_2, \beta_3$ and γ= coefficients of the independent variables
μ = is the error term

Dynamic Simultaneous-Equation Model

The extended Cobb–Douglas production framework has helped to explore the links among the three variables: FDIT, POV and TG. They were considered simultaneously in a modelling framework. To evaluate the impacts of FDIT on POV and TG, and to investigate the causality relationships with POV and TG, the study used the two-step System Generalized Method of Moments (GMM) approach (Gujarati & Porter, 2009; Omri, 2013). This approach is appropriate when estimating systems of equations that are over-identified (Ruxanda & Muraru, 2010; Greene, 2007) and it has been the preferred choice in empirical studies with numerous systems of equations (Ghatak & Halicioglu, 2007). The links among these variables were empirically examined by using Equation [4], Equation [5] and Equation [6].

The simultaneous-equation model used the following three equations:

$$LogFDIT_{i,t} = \xi_0 LogFDIT_{i,t-1} + \xi LogPOV_{i,t} + \xi LogTG_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$LogTG_{i,t} = \psi_0 LogTG_{i,t-1} + \varphi LogPOV_{i,t} + \varphi LogFDIT_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$LogPOV_{i,t} = \alpha_0 LogPOV_{i,t-1} + +\alpha LogTG_{i,t} + \alpha Log\ FDIT_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (6)$$

4 CONCLUSION

The system GMM estimator was used to find the three-ways linkages between FDIA, TG and POV. Each panel contains three different models; FDIT model, TG model and POV model. The results show that FDIT has bi-directional causal relationships with TG and POV. This suggests that higher TG does send positive signals to prospective FDIT sector. Secondly, TG is found to have a statistically significant effect on FDIT and on POV. This implies that the FDIT and POV demand are more closely related to the TG. Consistent with this view that TG leads to greater FDIT is the likelihood that POV reduction should be positively affected by increases in TG. Similarly, POV reduction has a statistically significant effect on FDIT, this concludes that FDIT is a determinant of POV; therefore, a high level of FDIT will decrease POV. Moreover, the results show that TG and POV have a significant bi-directional causal relationship. Since POV reduction is an important ingredient for TG, strong FDIT policies are required to attain sustained economic growth. This implies that a greater of POV reduction increases the demand of tourism sector accompanied by the FDIT which lead to a rapid improvement in the efficient use of tourism resources and thus resulted in a reduction of TG issues. This confirms that, in overall terms, an increase in the inflows of FDIT increases TG which attracts further FDIT into these countries. In overall, the results reveal that there is the bi-directional causal relationship between FDIT and POV. Lastly, the results also found that there is bi-directional causal relationship from POV to TG.

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