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MANAGING THE TOURISM-LED DEVELOPMENT STRATEGY IN POST-WAR SRI LANKA

-Invited Paper-

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Abstract

The Sri Lankan tourism industry has been booming since the end of war in 2009. Considering the key role that tourism can play in post-war economic development, the Sri Lankan government launched a Tourism Development Strategy (TDS). This study has evaluated the feasibility of achieving the targets of the TDS by building a simple tourism demand model and by undertaking a qualitative comparative assessment with a selected tourism booms in a number of war-affected countries. The findings suggest that the TDS targets are achievable provided the country manages to expand supply of tourism related infrastructure (hard as well as soft) in a price competitive manner.

1. Introduction

There is a large body of literature on the relationship between international tourism and economic development. This literature has focused on the tourism-led growth hypothesis and it has established that the development of the tourism sector generates economic growth (see Balaguer & Cantavella-Jordá, 2002; Hazari & Sgro, 1995). Many single country case studies and cross-country studies provide empirical support to the tourism-led growth hypothesis. Brau, Di Liberto & Pigliaru (2011, p. 244) emphasised that: "more recently, different studies – both analytical and empirical – go a step further by pointing out the possibility that tourism can make an economy grow at a rate comparable with, or even faster than, the ones associated with other types of specialisation, in which the potential for sector-specific technological progress is higher". Tourism has become an engine of growth in so-called tourism countries (TCs) such as Maldives, Pacific Island Nations and Island Nations in the

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West Indies. On the basis of the well-established empirical literature, tourism is "an increasingly popular component of development strategy in low-income countries" (Wattanakuljarus & Coxhead, 2008, p. 229). According to Wattanakuljirus & Coxhead (2008, pp. 829 - 230), the popularity of tourism as a component in development strategies is based on three beliefs. Firstly, tourism can play a substantial role in increasing foreign exchange earnings and in contributing to economic growth. Secondly, it can play an important role in improving income distribution through creating employment opportunities since tourism is a labour-intensive industry with relatively limited human capital skills required by employees. Finally, tourism is an environmentally friendly "clean" industry and its growth generally does not lead to adverse environmental impacts. On the basis of the above arguments policy makers can target tourism-led developments to accelerate economic growth and development in developing countries with potential for tourism development, particularly countries recovering from decades of war and conflict. Sri Lanka provides a fascinating example for a case study as it is recovering from three decades of political violence and a separatist war.

Following the end of nearly three decades of armed conflict between the *Liberation Tigers of Tamil Eelam* (LTTE) - commonly known as the Tamil Tigers - and government security forces in May 2009, Sri Lanka has witnessed an unprecedented post-war tourism boom. This tourism boom is similar to the experience of other former war affected Asian countries like Vietnam, Cambodia and Laos. The number of international tourist arrivals to Sri Lanka has sharply increased breaking all previous historical annual and monthly tourist arrivals records. The total number of arrivals has nearly tripled within four years (from 447,890 in 2009 to 1,274,593 in 2013). The experience of the short history of the post-war period shows that the tourism industry has now become a main driver of the Sri Lankan economy in terms of foreign exchange earnings, employment generation and attracting foreign direct investment (FDI). For example, in 2013 tourism generated 270,150 direct and indirect employment opportunities and US$ 1,715 million foreign exchange earnings for the Sri Lankan economy (see Central Bank of Sri Lanka, 2014).

After recognising the key role that the tourism industry can play in post-war development the Sri Lankan government launched a Tourism Development Strategy (TDS) with a five year master plan for 2011-2016 setting a number of important targets centred on attracting a large number of international tourists. This demonstrates that the Sri Lankan government is very keen to accelerate economic development through tourism. It is also important for Sri Lanka to implement marketing and management strategies to rebuild its image as an attractive and safe tourist destination after decades of negative international publicity highlighting the ongoing political violence, the war and persistent acts of terrorism prior to 2009 as well as concerns around alleged human rights abuses in the final stages of the war. In addition to the TDS, Sri Lanka has launched a massive marketing campaign under the tourism branding slogan of "Sri Lanka - the wonder of Asia". This strategy is important for Sri Lanka considering its effort to recreate its image and the competition it faces from other destinations in terms of attracting international tourists.

Against the above background, it is important to address some important issues related to the post-war tourism development, marketing and management strategies of Sri Lanka. Firstly, it is important to evaluate whether the TDS's targets are realistic or not as it appears that there has not been any systematic quantitative analysis conducted to guide the setting of its international tourism targets. In fact, with rare exceptions such as Selvanathan (2006), limited systematic quantitative studies exists in the Sri Lankan tourism literature aimed at setting targets based on empirical evidence. Secondly, it is important to identify the main constraints which need to be managed to accommodate a large influx of international tourists. Finally, the country has to maintain political stability and work towards reconciliation process with improved governance and maintaining rules of law in order for the development strategy to be fully realised.

This paper intends to make a number of contributions in terms of tourism strategy and management in Sri Lanka. The main contribution, however, is to evaluate whether the projections of tourist arrivals stipulated by the Sri Lankan government are achievable by using a simple econometric model and comparing the required growth rates with post-war tourism booms in some selected Asian countries. The rest of the paper is structured as follows. The next section provides a brief overview of Sri Lankan tourism in order to set the background for the study. A simple econometric model is developed in Section 3. Based on the empirical results of the model, the targets of the TDS are evaluated in Section 4. Some issues the Sri Lankan government needs to address are also discussed in this section. Section 5 makes a brief comparison of Sri Lankan tourism boom with post-war tourism booms in selected Asian countries. The final section is devoted to concluding remarks.

2. Tourism in Sri Lanka: Historical Perspective

Sri Lanka is an Island which can be considered as one of the TC as defined by Brau et al (2011) as a tourism destination, Sri Lanka has the ability to compete successfully with other destinations partly because of its pivotal geographical position. O'Hare & Barrett (1994, p. 43) pointed out that 'the Island 'controls' (as in colonial times) routes to the Far East as well as to other destinations in the Indian Ocean, the Middle East, Africa and Australasia'. Not only is its location an advantage, but also Sri Lanka offers a plethora of options for travellers including sunny beaches, favourable climate, rich cultural heritage, national parks and abundant wildlife (Lai, 2002). By using these advantages of location and natural as well as build attractions, the Sri Lankan government is currently promoting the country's tourism aimed at generating a significant expansion in incoming international tourist arrivals.

According to Sri Lanka Tourism Development Authority, the tourist industry in Sri Lanka began to develop on a commercial scale in 1966 with an introduction of a ten-year master plan for tourism development (see Fernando, Bandara, & Smith, 2013 for details of the evolution of tourism policies in Sri Lanka). There was a rapid increase in tourist arrivals during the period from 1966 to 1977, from 18,969 in 1966 to 153,665 in 1977 (see Figure 01). In other words, total international tourist arrivals to Sri Lanka grew at an average annual rate of 21 per cent over this period. With the introduction of open economic policies in Sri Lanka in 1977, the tourism industry

further expanded until 1982 - recording an average 23 per cent annual increase in tourist arrivals from 153,665 in 1977 to 407,230 in 1982. The period 1978-1982 can be considered as a relatively prosperous period in the early history of tourism in Sri Lanka. The first tourism boom (from 1966 to 1982) ended with the eruption of ethnic riots in July 1983 and the escalation of the separatist war in the North and East led by the LTTE. During the period 1983-2009, the Sri Lankan tourism industry was severely affected by this separatist war and the image of the country as a safe tourist destination was severely tarnished. Figure 01 illustrates the fluctuations of tourism arrivals in respective periods of war and peace.

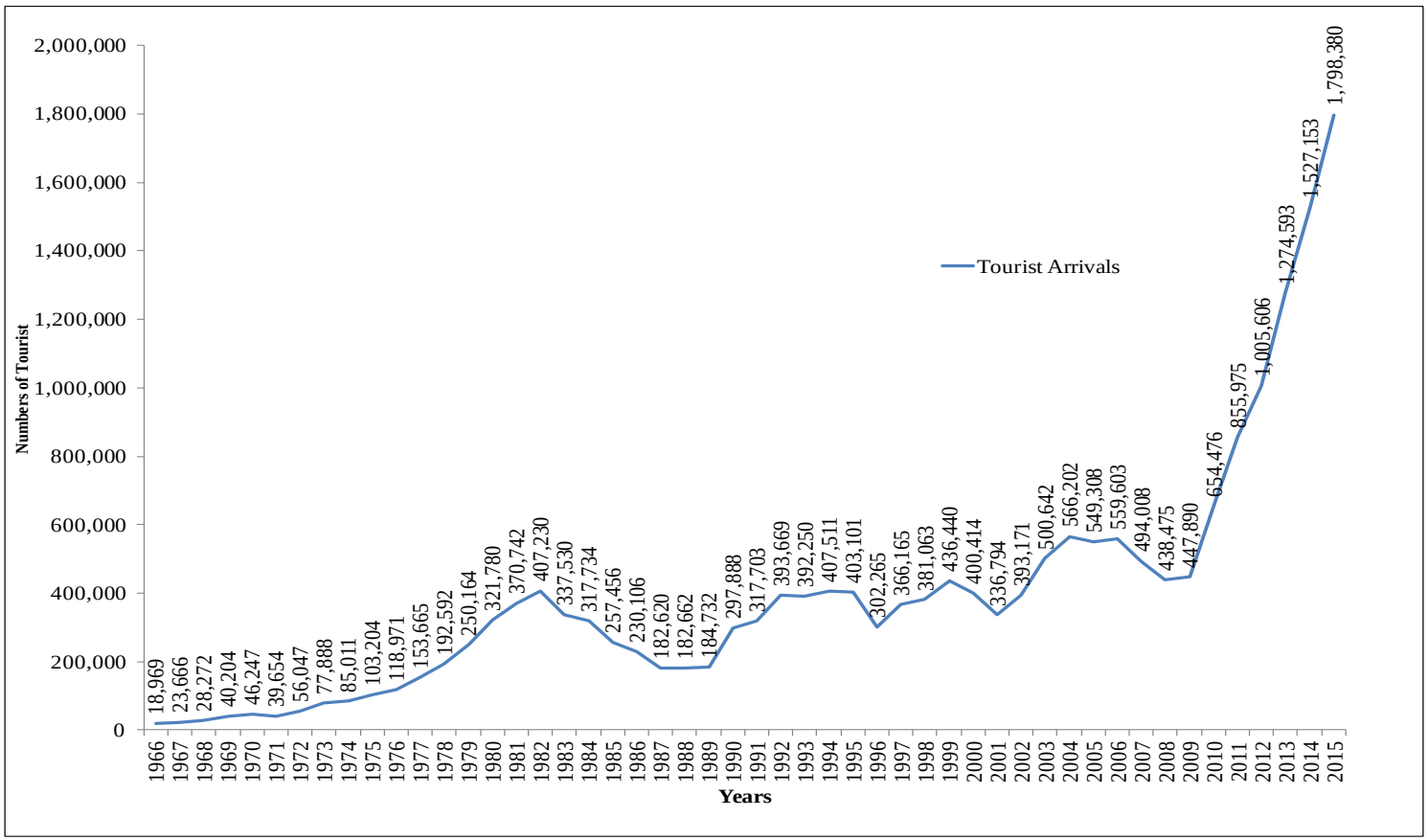
It can clearly be identified from Figure 01 that tourist arrivals to Sri Lanka fluctuated after 1983 during different war and peace episodes. The Sri Lankan tourism industry also suffered between 1987 and 1989 as an outbreak of political violence emerged in the South as well as the North and East (see Table 01 for a summary of these episodes Fernando, Bandara, & Smith, 2013 for a detailed discussion).

Table 01 presents average annual growth rates in international tourist arrivals during different episodes of peace which have generated the upward trends in Figure 01. These upward trends can be identified as a high level of tourist arrivals due to absence of war and the implementation of tourism promotional plans. According to Table 01, Sri Lanka witnessed an average growth rate of 21 per cent during five peaceful episodes since 1966.

This supports the empirical results of Selvanathan (2006, p. 37) who found that "the number of international tourist arrivals decreased by 21% during the war disturbances in Sri Lanka". The annual growth rate of the post-war tourism boom (at 25 percent) further supports the positive correlation between periods of peace and an expansion of tourist arrivals, as well as the negative correlation between periods of political violence and war and such arrivals.

The above brief overview indicates that the image of Sri Lanka as a tourist destination was damaged during nearly three decades of war and political violence. The post-war tourism boom indicates that it has managed to recover in the short run, however sustaining this growth over the longer term will require sustained and well-resourced planning, marketing and support from public authorities.

FIGURE 01
Tourist Arrivals to Sri Lanka and Year on Year Growth from 1966 to 2015



Source: Based on Sri Lanka Tourist Board Annual Reports, various issues.

TABLE 01
Tourism Growth during the War Peace Episodes

Peace Episodes and Tourism Development Effort	Periods of Upward Trends	Periodical Annual Growth (%)
Peace, democracy and political stability with a Ten Year Tourism Master Plan	1966-1982	22
Peace Talk II (1989/90) and second wave of economic reforms	1989-1992	23
Discussing constitutional changes as a solution to the ethnic problem (with war)	1997-1999	13
Cease Fire Agreement and Peace Talks IV	2002-2004	19
Post war tourism boom	2009-2013	26
Average periodical growth rate of positive trends		21

Episodes of War and Violence	Periods of Downward Trends	Periodical Annual Growth (%)
Eelam War I-Well-known ethnic riots in 1983 and the escalation of civil war in the North and East	1983-1986	-15
Eelam War III - Peace talks and its collapse	1994-1996	-13
LTTE attacked economic nerve centres in Colombo	2000-2001	-12
Eelam War IV and the end of war Beginning of full scale of war and the end of war in May 2009	2005-2008	-06

Source: Based on Sri Lanka Tourist Board data for 1970 to 2013.

3. Empirical Model for Tourism in Sri Lanka

There is a large body of literature on tourism demand modelling and forecasting. A number of previous studies have focused on the link between volatility and tourist arrivals in various countries (Chheang, 2008; Neumayer, 2004; Pizam & Smith, 2000; Sevil, 1998) and this has been important in terms for policy analysis and future tourism planning in TCs. A large number of tourism demand and forecasting models have been developed for tourism planning and management

using a number of statistical and econometric techniques as reviewed by Song & Li (2008) and Witt & Witt (1995) tourism demand can be measured by either using the number of inbound tourist arrivals or using foreign exchange receipts from international tourism (Neumayer, 2004). Many studies have used number of tourists to measure tourism demand. These studies have mainly forecasted the changes in the number of tourists over time and usually include a random (or stochastic) term which incorporates all the unknown effects on tourism demand over time. In the Sri Lankan context, a number of attempts have been made to analyse the link between tourism and political violence (Bandara, 1997; Fernando, 2015; Fernando, Bandara, Liyanaarachch, Jayathilaka, & Smith, 2013; Fernando, Bandara, & Smith, 2013; Fernando, Bandara, Smith, & Pham, 2015; Fernando & Bandaralage, 2016; Gamage, 1978; Gamage, Shaw, & Ihalanayake, 1997; O'Hare & Barrett, 1994; Selvanathan, 2006; Tisdell & Bandara, 2005; Wickremasinghe & Ihalanayake, 2006).

Although the Sri Lankan separatist war has been acknowledged as one of Asia's longest running wars there has not been any serious attempt to quantify the impact of war on tourism or the link between tourism and economic growth with the exception of Wickremasinghe & Ihalanayake (2006) and Selvanathan (2006). While this first study attempted to evaluate the relationship between GDP and tourism receipts in Sri Lanka, the second study examined the impact of separatist war which began in 1983 and the introduction of open economic policies in 1977. In this study we attempt to extend the Selvanathan study to accommodate the post-war scenario and evaluate the TDS's targets. Selvanathan (2006) has established the relationship between tourist arrivals and the impact of changes in economic policies and other disturbances such as opening up of the economy in the late 1970s and the separatist war in the North and East in Sri Lanka. According to Sevanathan's (2006) results, while inbound tourist arrivals were badly affected by the separatist war, open economic policies introduced in 1977 have created a positive impact on tourism. Other variables such as the exchange rate, the consumer price index (CPI) of Sri Lanka and per capita world income for the period 1972 - 2002 were included in this model. Although the model developed in this paper is somewhat similar to Selvanathan (2006), it differs in a number of ways. Firstly, our model focusses on the role of tourism in post-war development in Sri Lanka. Secondly, our data series is different from Selvanthan (2006) and we use a more comprehensive data set which includes coverage across more than four decades. In particular we use a data series for the period between 1966 and 2013, in contrast to the data series covered for a shorter period between 1972 and 2002 in Selvanathan (2006). Thirdly, we use directly a tourism price index rather than using a consumer price index as a proxy for changes in the cost of tourism. Finally, we use a dummy variable for the periods which showed upward trends in tourist arrivals as a result of the absence of the war.

In modelling the tourism sector, we use the annual international tourist arrivals data collected from the Sri Lanka Tourist Board for the sample period

between 1966 and 2013 (Ceylon Tourist Board, 1975; SLTDA, 2014). These data were plotted in Figure 01.

We use a dummy variable to investigate the impact of the peace and tourism growth during the past 47 years. The dummy variable for peace variable ($PEACE_t$) defined as 1 in the years when there was a peace in Sri Lanka (as described in Table 01) and 0 otherwise. Other independent variables are the exchange rate $(LEXR_t)$ and the tourism price index ($TPRICE_t$) for Sri Lanka. While the average annual exchange rate published by the Central Bank of Sri Lanka (The Central Bank of Sri Lanka, 2013) is used in this study, the tourism price index published by the Tourism Development Authority (SLTDA, 2014) is used for the price index.

In order to examine the relationship between the number of tourist arrivals and the above variables, and to evaluate the targets specified in the Sri Lankan TDS, the following simple regression model is used in this study:

$$LTOUR_t = \beta_0 + \beta_1 LEXR_t + \beta_2 TPRICE_t + \gamma_1 PEACE + \alpha_1 \varepsilon_{t-1} + \epsilon$$

where,

$LTOUR_t$ is the numbers of tourist arrivals;

$LEXR_t$ is the exchange rate;

$TPRICE_t$ is the tourism price index;

$PEACE_t$ is the dummy variable for peace variable.

The estimated model is given below and the detailed results, including those associated with various diagnostic tests, are shown in Table 02.

$$LTOUR_t = 9.7849 + 0.91356 LEXR_t - 0.1033 TPRICE_t + 0.2595 PEACE + 1.003 \varepsilon_{t-1} + \epsilon$$

TABLE 02
OLS Regression Estimation Results

Variable	Coefficient	t-statistic	P- value
LEXR	0.913562	94.02110	0.00
PEACE(-1)	0.259535	75.33827	0.00
TPRICE	-0.103328	-15.14792	0.00
RESID1(-1)	1.003335	260.0461	0.00
C	9.784935	753.0031	0.00
R-squared	0.999890		
Adjusted R-squared	0.999878		
Sum squared residual	0.003109		
Durbin-Watson statistic	1.335254		
F-statistic	86006***		

Source: Authors' Calculations.
Note: *** are significant at the 0.01 level.

As can be seen from Table 02, all three independent variables are statistically significant at the one per cent level. The exchange rate and tourist arrivals are positively related demonstrating, as expected, that depreciation of the exchange rate is good for tourism. This indicates that a depreciating currency serves as an important variable to improve the competitiveness in Sri Lanka as an important tourist destination in the Asian region. This is important in the context of the depreciation of Sri Lankan rupee in early 2012 after the Central Bank of Sri Lanka gave up the maintenance of an overvalued exchange rate. Our results strongly suggest that this recent depreciation will have a positive impact on the Sri Lankan tourist industry. The empirical results also suggest that there is a negative relationship between increases in the tourism price index and the demand for tourism by international visitors. This demonstrates that the importance of managing the Sri Lankan tourism boom properly in order to avoid an escalation of cost in the tourism industry as it absorbs the projected expansion in tourism demand. Finally, the results strongly demonstrate that (with the lag of the dummy variable constructed to capture the impact of peace and war on tourism) tourist arrivals to Sri Lanka would increase by 26 per cent per year if a peaceful environment can be maintained. These results are consistent with Selvanathan (2006), and clearly indicate that it is a necessary condition for Sri Lanka to maintain the political stability and accelerate reconciliation process in order to use tourism as a driving force of post-war economic development.

The highly significant F-statistics as well as the high adjusted R^2 shown in Table 02 demonstrate that the estimated model has excellent explanatory power. In

addition the first order lag term for the dummy variable eliminates the autocorrelation which would otherwise exist in our time series model.

4. Appraisal of Targets of TDS

TDS's Targets

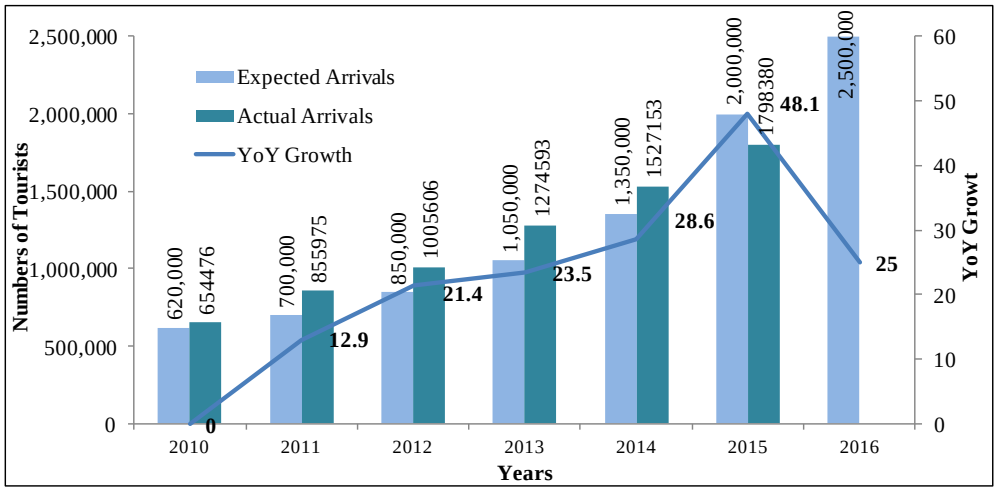
As noted in the introduction, the Sri Lankan government has launched the TDS for the period 2011-2016, after recognising tourism as a major component in its post-war development strategy. It has a number of ambitious targets. These include "an increase in tourist arrivals from 650,000 in 2010 to 2.5 million by 2016, attract US $3 billion of FDI within the planned period, an increase in direct and indirect tourism related employment opportunities from 125,000 in 2010 to 500,000 by 2016, distribution of the economic benefits of tourism to a larger cross-section of the society, increase in foreign exchange earnings from US$ 500 million to US$ 2.75 billion by 2016, contribute towards improving the global trade and economic linkages of Sri Lanka and position Sri Lanka as the world's most treasured island for tourism" (Ministry of Economic Development, 2011, p. 4). These targets are almost four times of the values of 2010 in terms of numerical values. All other targets are related in the sense that they depend on realisation of the target of attracting a large and expanding number of international tourists.

Appraisal of TDS's Targets Using Empirical Results

Using the estimated results of the econometric model in the previous section we can evaluate the feasibility of achieving the tourist arrival target of the TDS. According to TDS, it is very clear that government's growth strategy is consolidate first and then target exponential growth which means that for the first four years the Government expects 12.9 per cent to 28.6 per cent per year growth rates. From then on the growth rate is anticipated as accelerating up to 48.1 per cent in 2015 and finally to stabilise at around 25 per cent growth per annum in 2016 (see Figure 02 for more details).

According to Figure 02, actual tourist arrivals have been more than expected against the target set for each of the past five years and this has already been reached for 2014 with more than 1,500,000 tourist arrivals. The average annual growth rate from 2009 to 2014 was 25 per cent and this is closely in line with our econometric estimations. It is also possible to compare our estimation with the government targets incorporated in the TDS for the 5 year period 2012-2016. Table 03 illustrates TDS targets and our estimation according to respective year on year (YoY) growth rates.

FIGURE 02
Expected Tourist Arrivals and Growth 2010 to 2016



Source: Based on Tourism Development Plan 2011 – 2016 (Ministry of Economic Development, 2011) and Sri Lanka Tourism Annual Report (SLTDA, 2012).

TABLE 03
Projected Tourism Arrivals to Sri Lanka according to the TDS and the Model

Year	2010	2011	2012	2013	2014	2015	2016
TDS target	620,000	700,000	8850,000	1,050,000	1,350,000	2,000,000	2,500,000
Y o Y Growth according to TDS	N/A	12.9%	21.4%	23.5%	28.6%	48.1%	25.0%
Y o Y Growth of the estimation	N/A	26%	26%	26%	26%	26%	26%
Our Model's Estimation	N/A	824,640	1,039,046	1,309,198	1,649,590	2,078,483	2,618,888
Actual arrivals	654,474	855,975	1,005,606	1,274,593	1,527,153	1,798,380	N/A

Source: Based on tourism development plan 2011 – 2016 (Ministry of Economic Development, 2011) and authors' calculation.

If other factors remain favourable (such as peace and political stability, exchange rates, price competitiveness, and the international environment) our empirical results suggest that TDS's target of achieving 2.5 million tourism arrivals by 2016 is realistic. Although the targets are statistically feasible, it is important to evaluate the feasibility of achieving TDS's targets further by comparing the performance of tourism in terms of tourist arrivals of selected Asian countries which experienced similar post-war tourism booms.

A Comparative Analysis

The prospects of post-war tourism in Sri Lanka can be evaluated by examining the experience of post-war tourism booms in selected three Asian countries, namely Vietnam, Laos and Cambodia (see more details of the comparisons among these countries Fernando, Bandara, & Smith, 2013) This evaluation is important in terms of managing the post-war tourism boom in Sri Lanka. First consider the case of Vietnam. The long war in Vietnam ended in the middle of 1970s and the Vietnamese economy was opened to the outside world in the 1980s with a reform programme. As shown in Table 03, the number of tourist arrivals has increased more than seven times in the decade of 1990s and that number has further increased two times from 2000 to 2010 (from 2.1 million to 5.0 million). In fact, Sri Lanka attracted more international tourists than Vietnam in 1990. However, Sri Lankan tourism was affected by the war in the 1990s and the first decade of the 21st century while Vietnamese tourism flourished with the end of its war and the opening its economy during the same period.

The post-war tourism boom in Cambodia and Lao PDR is even more spectacular. The war ended in Cambodia in the 1980s and it managed to establish peace and stability by 1990. During the same period Lao also managed to establish peace and open its economy. While tourist arrivals to Cambodia increased by 27 times from 1990 to 2000, Lao's arrival numbers increased by 51 times during the same period. The number of tourist arrivals to both countries further increased by five times and two and half times from 2000 to 2010, respectively. The experiences of all the above three countries suggest that the TDS's targets can be achievable in Sri Lanka if the country handles the tourism boom properly and manages to maintain internal peace and political stability.

TABLE 04
Benchmark Comparison of Tourism Arrivals with Neighbour Countries

Years	Sri Lanka	Cambodia	Lao PDR	Vietnam
1966	18,969	24,781	N/A	24,381
1990	297,888	17,000	14,400	250,000
1995	403,101	219,680	346,000	1,351,000
2000	400,414	466,365	737,000	2,150,000
2005	549,308	1,421,615	1,095,000	3,468,000
2009	447,890	2,161,577	2,008,363	3,772,000
2010	654,774	2,399,000	N/A	5,050,000

Source: Based on various Tourism Annual Reports of respective countries and the World Tourism Organisation.

Tourism is one of the most competitive industries among destinations. How competitive is the post-war tourism sector in Sri Lanka in comparison with other war-affected countries? This can be answered by using the Travel and Tourism Competitiveness Index (Leung & Baloglu, 2013). The reputation and competitiveness of each destination is measured both overall and via various sub-indices. The destinations are given ranked positions on each of the sub-indices as well as overall. According to Travel & Tourism Competitiveness Indexes in 2011 (Leung & Baloglu, 2013), on the overall index Sri Lanka is ranked at 81 out of 139 countries. Sri Lanka is ahead of countries like Cambodia and similar to countries like Vietnam (see Table 05).

Table 05 also presents data related to three sub-indices. Once again, Sri Lanka is ahead of countries like Cambodia and Vietnam in terms of the sub-index of tourism and travel regulatory framework. This sub-index captures elements of government policy related to tourism. The second sub-index captures elements of the business environment and the "hard" infrastructure of each economy. Sri Lanka is once again ranked ahead of Vietnam and Cambodia in terms of this sub-index. The third sub-index captures the "softer" human, cultural, and natural elements of each country's resource endowments. Sri Lanka does not perform as well on this index as Vietnam but outranks Cambodia.

The above data indicate that the Sri Lankan tourism industry is in a favourable position to achieve the target of 2.5 million tourism arrivals by 2016 if the country can maintain peace and stability, and provided satisfying the anticipated increase in tourist arrivals does not lead to price pressures relating to various forms of supply side constraints.

TABLE 05
Travel and Tourism Competitiveness Index 2011 & 2013

	2011			2013		
	Cambodia	Sri Lanka	Vietnam	Cambodia	Sri Lanka	Vietnam
Overall Index	109	81	80	106	74	0
Sub-indices						
Tourism &Travel Regulatory Framework	110	79	89	105	61	8
Tourism &Travel Business Environment and Infrastructure	118	83	89	112	86	4
Tourism &Travel Human, Cultural and Natural Resources	81	68	46	81	66	3

Source: Travel and Tourism Competitiveness Report 2011 -2013.

Managing TDS Targets

The TDS has itself identified a number of requirements necessary for the nation to achieve its targets (Ministry of Economic Development, 2011, pp. 8-13). Should these requirements not be met during the period of implementation of TDS, they would become constraints on the achievement of the various targets that lie at the heart of the strategy.

Constraint 1: Existing Supply of Accommodation Needs Supplementation

Firstly, the Sri Lankan tourism industry needs around 45,000 hotel rooms to accommodate the estimated 2.5 million tourists by 2016 (according to TDS). In other words, it has to double the number of hotel rooms (there were 22,735 rooms in 2010). This represents a massive challenge. The Sri Lankan hotel industry comprises tourist hotels that are graded establishments, along with other establishments such as guest houses and inns registered with the Sri Lanka Tourism Development Authority (SLTDA, 2012). The hotels and other establishments are classified by the SLTDA by a star category which is based on the classification set out by the World Tourism Organisation. Major hotel players operating in Sri Lanka include domestic operators (such as John Keells Hotels and Aitken Spence) and foreign players (such as Taj Hotels & Resorts, Hilton and Holiday Inn). According to the Sri Lanka Tourism Annual Report, the lodging establishments registered with

the SLTDA amounted to 783 which provided 20,609 rooms as at 2012 and the annual hotel room occupancy rate was of 70.1% (see Table 06 for more details).

Table 06
Accommodation Capacity

Class of Accommodation	Accommodation Capacity			Room Occupancy Rate
	No. of Units	No. of Rooms	No. of Beds	
Hotels	**269**	**15,510**	**30,399**	**71.2**
5 Star	14	3,230	6,420	71.5
4 Star	15	1,784	3,329	69.7
3 Star	16	1,201	2,378	65.3
2 Star	36	2,022	3,981	71.9
1 Star	34	1,171	2,322	70.3
Unclassified	155	6,102	11,969	78.6
Supplementary Establishments	620	6,577	13,113	76.2

Source: Annual Statistical Report of Sri Lanka Tourism – 2012.

Clearly the existing accommodation capacity in the Sri Lankan tourism sector is inadequate to cater to anticipated tourism demand or target. Since it is a difficult task to build a large number of hotel rooms in a very short period of time, the government has initiated some other community based alternative accommodation development programs such as the 'home stay' program. However, higher-quality accommodations are necessary for Sri Lanka to attract quality high spending tourists. According to the SLTDA, only about 6,000 of the currently available rooms are of medium to high quality. Refurbishment of existing hotel rooms is one option to meet the expected number of high quality tourists.

Another longer term option is to build new high quality hotels. The government has approved a number of new projects recently especially focusing on the Northern and Eastern beaches which were relatively unexplored by the tourists due to nearly three decades of separatist war. As Kiriella (2011, p. 3) indicate "the opening up of the North and the East of the country, a hither to undiscovered part of the island which is teaming with untouched beaches, idyllic villages and cultural treasures galore would be a great attraction for travellers". These untapped beaches are becoming very popular among local investors now. A number of hotels have been built or being constructed in these areas to attract overseas visitors. For

examples, Kuchchavelli Resort development project is being developed with area of approximately 500 acres near by popular Nilaveli Beach in Trincomalee. According to the SLTDA, this development is proposed to include more than 3,000 hotel and resort rooms, along with theme parks and water park facilities. Batticaloa has another popular beach in the East which has Pasikuda Resort development project with area approximately 150 acres of land close to the beach. Meanwhile, Kalpitiya Resort development project and Dedduwa Resort development project are developing in the west coast. The Kalpitiya Tourism Development Program is going to be conducted in 14 islands; it will include 17 hotels with a total capacity of 5,000 rooms and 10,000 beds upon completion, along with an amusement park, golf course, race course, and a domestic airport at Uchchamunai. Those four Resort development projects can be considered as new massive tourism potentials in Sri Lanka (Clearer Skies, 2011).

Constraint 2: Need for Improved Economic Infrastructure

The tourism industry needs improved transport infrastructure facilities in order to be able to meet the needs of the anticipated increase in tourism numbers. Despite the recent implementation of massive infrastructure development projects, Sri Lanka has a long way to go to catch up with other favoured Asian tourist destinations like Singapore and Thailand. The country is still lagging behind in terms of road and rail transport. Moving tourists from one location to another location within the country is still time consuming due to poor infrastructure. Although Sri Lanka is an island, it is yet to have the facilities needed to promote and accommodate significant overseas tourism arrivals by sea. However, tapping in to sea travellers (such as the cruise ship market) is at embryonic state. The port infrastructure in the North and the East was severely damaged by the war and rebuilding is necessary in order for tourism potential to be fully realised.

Sri Lanka's first ever access controlled expressway from Kottawa to Galle was opened in November 2011 connecting the Western province to the Southern province which covers most popular tourism zone especially in terms of beaches. The section from Galle to Matara (of length 35km) was also completed in 2013. Meanwhile, the Colombo – Kandy and Colombo – Jaffna Expressways are planned to be constructed and the Colombo – Katunayake Airport expressway was opened in 2013. In addition, the Sri Lankan government has planned to construct three elevated highways connecting the three expressways which are under construction now (Central Bank of Sri Lanka, 2011). These road system developments are one of the most significant improvements for the competitiveness of tourism in Sri Lanka. In addition to the road transport system, improvements to the rail transport network also have a great potential to facilitate the tourism boom.

Constraint 3: Lack of Trained Human Resources

The TDS has identified two types of human resource gaps: the gap in the accommodation industry itself, and the gap in related services. The industry is

facing a shortage of trained workers because of decades of neglect in training tourism workforce due to civil disturbances. As highlighted in an industry report, the tourism sector needs five times of the current work force to cater for 2.5 million tourists by 2016 (Clearer Skies, 2011). The hospitality related education and training facilities are not sufficient to train such high numbers of workers or to train workers at the level needed to compete effectively in the high end of the tourism sector.

Educated and trained labour force is required to develop the tourism sector in Sri Lanka. Sri Lanka has a good record of maintaining a high literacy rate (over 90 per cent) for both males and females compared with many other Asian countries. To train specialist labour force for the tourism industry, the Sri Lanka Government established the Sri Lanka Institute of Tourism & Hotel Management (SLITHM) in 1964. In addition, a few national universities and several private sector institutions are engaged in training the labour force for top and middle management positions in the industry. There are other supplementary short courses conducted by various government departments. Due to lack of information, the number of graduates from private institutions cannot be estimated; but the SLITHM and national universities only produce some 3,000 graduates each year. At present, the tourism sector has employed about 163,000 people (both directly and indirectly). However, there is currently a severe shortage of employees in the hotel sector. According to the TDS, Sri Lanka expects to generate a need for an additional 500,000 employees in this sector for next five year to cater for an expected 2.5 million tourists in 2016. As such, the number of such personnel must augment 5-fold within the next 5 years - a demanding task given the current state of tourism education in the country.

Filling this anticipated shortage in labour supply without stimulating higher wages in tourism related sectors, and hence reduced international price competitiveness, remains a challenge.

Constraint 4: Movement towards attracting Higher End Tourism Demand

According to the Tourism Development Strategy 2011 – 2016, the industry is expected to move towards premium prices with greater value addition attracting higher spending tourists. It is important that the country moves away from low cost tourism and focuses on high end tourism (Ministry of Economic Development, 2011). Although the country expects to move away from the low cost tourism and focuses on high end tourism, attracting quality tourists has been a main issue. There have been growing number of South Asian tourists and members of Sri Lankan diaspora compared with tourists from rich western countries. According to some recent estimates, 20 per cent of recent tourist arrivals are members of huge Sri Lankan diaspora who are visiting friends and relatives (see Miththapala, 2012). According to the same source, only 82 percent of international arrivals in 2010 were "real tourists" who stayed in hotels.

Constraint 5: Maintaining Price Competitiveness Compared with Like Destinations

Rapidly increasing accommodation costs represent another constraint on meeting tourism targets. According to some recent reports, (Clearer Skies, 2011), the pricing of hotel accommodation is not competitive and Sri Lankan hotel accommodation is over-priced for its quality compared with its rivals. While Sri Lanka is more expensive than many other countries for four-star and five-star accommodation, it is more competitive in terms of the price of three-star rated beach resort hotels – yet these are generally not of a standard that is attractive to international tourists. The room-rates in Sri Lanka have gone up because of the post-war tourism boom such that comparable room rates in other tourist destinations like Thailand, Indonesia, Vietnam and Kenya are cheaper than Sri Lanka. Over the last few years, hotel charges have gone up by about 50 per cent (Clearer Skies 2011). Some believe that the government regulation of these charges represents an unhealthy intrusion in to the sector and that it is important to allow rates to be determined by the market (The Nation, 2011). The tourist price index estimated by the Sri Lanka Tourism Development Authority (2010) shows that the index has increased by 5.3 per cent in 2010.

Sri Lanka competes with other countries in South Asia and the Asia Pacific region. According to our OLS regression results shows that there is a 10 per cent negative impact of the tourist price index on the demand for tourism in Sri Lanka. However, the overall tourist price index showed an increase of 5.3 per cent, when compared with the previous year. In absolute terms, it increased by 1,510 points from 4,940 in the 2009/2010 season, to 6,450 in the 2012/2013season (SLTDA, 2012). Prices of the accommodation sector increased by 3.9 per cent while the food & beverage sector increased by 6.1 per cent and the transport sector increased by 7.7 per cent (SLTDA, 2012). According to the Global Hotel Price Index, Sri Lanka's 5-star room rates had increased by 21.38 per cent in December 2010 compared to the previous year; and this represented the fifth-largest spike in room rates globally over the same time period. A further increase was seen in April 2011, in accordance with the government's requirement to raise minimum room rates. This price increase is likely to influence given the investors to the government to broaden their profit margins. Table 07 highlights the recent rate changes in Colombo based hotels.

When compared with the regionally competitive destinations, these 5 star hotel rates are lower than Singapore (US$ 144) and Mumbai (US$ 141) but higher than Manila (US$ 67), Kuala Lumpur (US$ 78), Jakarta (US$ 80), Bangkok (US$ 67) and Ho Chi Minh City (US$ 68) hotels prices in March 2011.

TABLE 07
Minimum Government Rates in Colombo Hotels

Date of Rate Revision	Minimum Hotel Room Rate (USD/night)				
	5 Star	4 Star	3 Star	2 Star	1 Star
January 2009	75	60	45	30	20
January 2011	100	85	70	55	40
April 2011	125	95	95	80	65

Source: Based on SLTDA Data.

5. Conclusion

Sri Lankan tourism has managed to recover quickly since the end of war in 2009. After recognising the role of post-war tourism the Sri Lankan government has launched the TDS for the period 2011-2016. In this study, we evaluated the post-war tourism boom and the targets of Sri Lankan government's TDS. We empirically explored whether the targets set in the TDS by the Sri Lankan government are achievable or realistic by using a simple econometric model and with a comparison of the experience of post-war tourism booms in selected Asian countries.

Our econometric analysis suggests that tourist arrivals to Sri Lanka would increase by 26 per cent per year if peaceful environment exits in Sri Lanka. This is consistent with the targets set out in the TDS without systematic modelling work. The comparison of countries with similar experience in the region also demonstrated that Sri Lankan tourism targets can be achieved. However, there are number of impediments such as limited number of hotel rooms, weak infrastructure and rising accommodation costs to be recognised in achieving such targets.

Accordingly, a number of policy inferences can be drawn from this study. Firstly, many developing countries recovering from decades of wars like Sri Lanka, Vietnam or Cambodia experience post-war tourism booms. Therefore, tourism becomes a main component of their post-war development strategy. Secondly, tourism-led development strategies in these countries have been influential in post-war economic growth. Thirdly, Sri Lanka needs to be proactive in developing policies to overcome the impediments to growth identified above. There is little use promoting the country as a price competitive and safe tourism destination unless these impediments are adequately addressed at the same time. Given the limited resources available to the Sri Lankan government and the competing claims on these resources, development of strategies for and active promotion of public-private partnerships aimed at creating new tourism related infrastructure (hotel resorts, cruise line facilities, road transport upgrades, etc.) are recommended.

References

Balaguer, J., & Cantavella-Jordá, M. (2002). Tourism as a long-run economic growth factor: the Spanish case. *Applied Economics*, *34*(7), 877-884. doi:10.1080/00036840110058923

Bandara, J. S. (1997). The impact of the civil war on tourism and the regional economy*. *South Asia: Journal of South Asian Studies*, *20*(sup001), 269-279. doi:10.1080/00856409708723315

Brau, R., Di Liberto, A., & Pigliaru, F. (2011). Tourism and development: A recent phenomenon built on old (Institutional) roots? *The World Economy, 34*(3), 444-472. doi:10.1111/j.1467-9701.2010.01320.x

Ceylon Tourist Board. (1975). Annual statistical report / Ceylon tourist board. (Accessed from http://nla.gov.au/nla.cat-vn2695813).

Chheang, V. (2008). The political economy of tourism in Cambodia. *Asia Pacific Journal of Tourism Research, 13*(3), 281-297. doi:10.1080/10941660802280414

Clearer Skies. (2011). *Growth drivers of the Sri Lankan hotel industry*. Retrieved from http://www.ram.com.lk/other_pdf/commentary%20-%20Hotel%20sector%20_April%2011_.pdf

Fernando, S. (2015). *Tourism in Sri Lanka and a computable general equilibrium (CGE) analysis of the effects of post-war tourism boom.* (Unpublished Ph.D Thesis), Griffith University, Griffith Bussines School.

Fernando, S., Bandara, J. S., Liyanaarachch, S., Jayathilaka, R., & Smith, C. (2013). Political violence and volatility in international tourist arrivals: the case of Sri Lanka. *Tourism Analysis, 18*(5), 575-586. doi:10.3727/108354213x13782245307876

Fernando, S., Bandara, J. S., & Smith, C. (2013). Regaining missed opportunities: the role of tourism in post-war development in Sri Lanka. *Asia Pacific Journal of Tourism Research, 18*(7), 685-711. doi:10.1080/10941665.2012.695284

Fernando, S., Bandara, J. S., Smith, C., & Pham, T. (2015). SLCGE-Tourism: a computable general equilibrium model of the Sri Lankan economy for tourism policy analysis. *Griffith Business School, Discussion Papers - Economics, 2015-06*, 33. Retrieved from Griffith University website: https://www120.secure.griffith.edu.au/research/items/694206df-16db-4622-b239-c1b60cae4de8/1/

Fernando, S., Bandara, J.S., & Smith, C., under review for publication as a chapter on "Tourism in Sri Lanka" (Vol. 2): Routledge.

Gamage, A. (1978). *Tourism in the economy of Sri Lanka*. Unpublished Masters Thesis. Unpublished Masters Thesis. Scottish Hotel School.

Gamage, A., Shaw, R. N., & Ihalanayake, R. (1997). The cost of political upheaval to international tourism in Sri Lanka. *Asia Pacific Journal of Tourism Research, 2*(1), 75-87. doi:10.1080/10941669808721987

Hazari, B., & Sgro, P. M. (1995). Tourism and growth in a dynamic model of trade. *The Journal of International Trade & Economic Development, 4*(2), 243-252. doi:10.1080/09638199500000019

Kiriella, M. B. (2011). Reaping the benefits of the peace; selling destination Sri Lanka. *SLTDA Resources.* Retrieved from http://www.sltda.gov.lk/home

Lai, T.-W. (Ed.) (2002). *Promoting sustainable tourism in Sri Lanka*: Asian Productivity Organization.

Leung, X. Y., & Baloglu, S. (2013). Tourism Competitiveness of Asia Pacific Destinations. *Tourism Analysis, 18*(4), 371-384. doi:10.3727/108354213x13736372325876

Ministry of Economic Development. (2011). *Tourism development strategy 2011 - 2016*. Retrieved from Colombo, Sri Lanka: http://srilanka.travel/catalog/view/theme/default/image/pdf/English.pdf

Miththapala, S. (2012). Diaspora living abroad account for 20% of tourist arrivals to Sri Lanka. *The times of Sri Lanka.* Retrieved from http://www.timeslanka.com/2012/06/19/diaspora-living-abroad-account-for-20-of-tourist-arrivals-to-sri-lanka/

Neumayer, E. (2004). The impact of political violence on tourism. *Journal of Conflict Resolution, 48*(2), 259-281. doi:10.1177/0022002703262358

O'Hare, G., & Barrett, H. (1994). Effects of market fluctuations on the Sri Lankan tourist industry: resilience and change, 1981–1991. *Tijdschrift voor economische en sociale geografie, 85*(1), 39-52. doi:10.1111/j.1467-9663.1994.tb00672.x

Pizam, A., & Smith, G. (2000). Tourism and terrorism: a quantitative analysis of major terrorist acts and their impact on tourism destinations. *Tourism Economics, 6*(2), 123-138. doi:10.5367/000000000101297523

Selvanathan, S. (2006). The effect of war and other factors on Sri Lankan tourism. *Applied Economics Letters, 14*(1), 35-38. doi:10.1080/13504850500425576

Sevil, F., Sönmez. (1998). Tourism, terrorism, and political instability. *Annals of Tourism Research, 25*(2), 416-456. doi:10.1016/s0160-7383(97)00093-5

SLTDA. (2012). *Annual statistical report of Sri Lanka tourism*. Retrieved from http://sltda.lk/statistics

SLTDA. (2014). *Annual statistical report of Sri Lanka tourism - 2013*. Retrieved from http://sltda.lk/statistics

Song, H., & Li, G. (2008). Tourism demand modelling and forecasting-A review of recent research. *Tourism Management, 29*(2), 203-220. doi:10.1016/j.tourman.2007.07.016

The Central Bank of Sri Lanka. (2013). *Annual Report 2013*. Retrieved from 30, Janadhipathi Mawatha, Colombo 01: http://www.cbsl.gov.lk/htm/english/10_pub/p_2.html

The Nation. (2011). The boom in tourism: great expectations. *News Features.* Retrieved from http://www.nation.lk/2011/07/17/newsfe4.htm

Tisdell, C. A., & Bandara, R. R. (2005). *Tourism and economic development in Sri Lanka* (1st ed. Vol. 1): Serials Publications; New Delhi

Wattanakuljarus, A., & Coxhead, I. (2008). Is tourism-based development good for the poor?: A general equilibrium analysis for Thailand. *Journal of Policy Modeling, 30*(6), 929-955. doi:10.1016/j.jpolmod.2008.02.006

Wickremasinghe, G. B., & Ihalanayake, R. (2006). The causal relationship between tourism and economic growth in Sri Lanka: Some empirical evidence. *WP2006.10, School of Applied Economics, Victoria University*.

Witt, S. F., & Witt, C. A. (1995). Forecasting tourism demand: A review of empirical research. *International Journal of Forecasting, 11*(3), 447-475. doi:10.1016/0169-2070(95)00591-7

DETERMINANTS OF INTEREST RATES: THE CASE OF SRI LANKA

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Abstract

Many studies have looked in to the determinants of interest rate in developed countries. The objective of this paper is to examine the determinants of interest rates in Sri Lanka. The model employed in this study is based on the framework developed in Edwards and Khan (1985) and a few modifications suggested in Cavoli (2007), Cavoli and Rajan (2006), Berument, Ceylan and Olgun (2007) and Zilberfarb (1989). The model nests the interest rate parity theory, liquidity preference theory and the Fisher hypothesis augmented with inflation uncertainty. We employ Autoregressive Distributed Lag (ARDL) approach to capture long-run relationships among the variables involved. Quarterly data from 2001:1 to 2012:2 has been used. There are a few important findings. First, there is no evidence for inflation uncertainty in Sri Lanka during the sample period concerned. Second, the ARDL bound testing approach suggests that there is no long-run impact of the national income, money supply, inflation, foreign interest rates and net foreign assets on the domestic interest rate. Third, apart from the interest rate parity conditions, neither the liquidity preference theory nor Fisher effect is useful in explaining short-run interest rate changes in Sri Lanka during the period in question.

Keywords: Interest Rate, Liquidity Preference Theory, Fisher Hypothesis, Interest Rate Parity, ARDL Bound Testing Approach

1. Introduction

Interest rate can be considered the cost incurred on borrowing money or the compensation for the service and risk of lending money to defer the opportunity of spending in the present. It is also a source of information required for policy making and an operating instrument in monetary policy. In such a context, a proper understanding of the determinants of the interest rates and estimating the degree of their impact on interest rates is extremely useful in both public and private financial decision making.

Most of the previous studies on interest rate in Sri Lanka are limited to either the examination of interest rate structures or testing the validity of the Fisher

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hypothesis in Sri Lankan financial markets. Hettiarachchi (1976), for instance, examines both the level and the structure of interest rates in Sri Lanka. Cooray (2002) focuses on Fisher relationship and cites evidence that there is a weak support for the Fisher hypothesis in Sri Lanka. Contrary to Cooray (2002), Berument, Ceylan and Olgun (2007) find that the Fisher hypothesis is not significant in Sri Lankan financial markets. Udayaseelan and Jayasinghe (2010) report that there is no empirical support even for a partial Fisher effect in Sri Lanka. Hemachandra (2009) examines the recent experience of using the interest rate as a policy instrument. Hemachandra (2010) focuses on the factors that would determine the variations in interest rates across various financial assets and markets in Sri Lanka. Accordingly, factors affecting the interest rate behavior include policy rates, cost of funds, type of instruments, term structure, regulations, liquidity in the markets, competition, technology, inflationary expectations etc. However, none of these studies inquire into the general determinants of the interest rate in Sri Lanka which is the objective of this paper.

The paper is organized as follows. Section 2 provides a brief survey of literature. Theoretical framework in outlined in Section 3. Section 4 describes some important remarks related to data. Empirical analysis is carried out in Section 5. Concluding remarks are contained in Section 6.

2. A Brief Survey of Literature

In literature, there exist a number of theories that explain the determination of interest rate in an economy. Liquidity preference approach developed in Keynes (1936) views the interest rate determination as a result of the interaction between demand for and supply of money in the money market. Accordingly, supply of money and real income are instrumental in determining the interest rate. The relationship developed in Fisher (1930) and commonly known as the Fisher hypothesis views nominal interest rate as the sum of real interest rate and expected inflation rate. It also suggests a one-for-one relationship between the nominal interest rate and expected inflation rate implying that the real interest rate usually remains constant. Assuming identical financial assets in two economies in question, uncovered interest parity indicates that interest rate differential in two economies is equal to the expected exchange rate change between the currencies used in the two economies. This also implies that the domestic interest rate is equal to the foreign interest rate plus expected exchange rate change. According to the loanable funds theory, interest rate is determined by the demand for and supply for loanable funds.
Edwards and Khan (1985), a study that later became the initial impetus of a number of studies of that nature, combines the implications of the liquidity preference approach, Fisher relationship and uncovered interest parity and develops a reduced form model to analyze the determinants of the interest rate in semi-open economies. While interest rates in open economies are likely to be determined through the uncovered interest parity relationship, interest rates in closed economies are more likely to be influenced by domestic factors such as real income, money stock and

expected inflation. According to Edwards and Khan (1985), interest rates in semi-open economies can be thought of as the weighted average of the interest rates in open and closed economies. Whether the internal factors dominate or the external factors dominate is dependent on the degree of openness. More importantly, if the trade account is fully open though the capital account is completely closed, the external factors could still affect the domestic interest rate indirectly. For instance, terms of trade shock can result in changes in real income and prices, which will affect the domestic demand for credit, and thus equilibrium interest rates. Empirical evidence from Colombia (a small semi-open economy) and Singapore (a small open economy) has been cited in support of the proposed model. The model has been highly successful in explaining the behavior of the interest rate in these two economies.

Several authors have extended the Edwards and Khan (1985) model (EK model) to analyze the behavior of interest rates in semi-open developing economies. Gochoco (1991), for instance, develops a model to find the determinants of interest rate in Philippines. The study introduces a few changes related to the macroeconomic factors to the EK model. The liquidity and Fisher effects are allowed to occur concurrently due to different components of monetary growth. The expected inflation is measured as the difference between anticipated monetary growth and the growth of output whereas the liquidity effect is represented by the money supply that is measured by the unanticipated monetary growth.

Bar-Efrat (1993) applies the EK model to Israel for a period during which a program of liberalization gradually eases controls over capital movements to and from the country. The period under study is divided into sub-periods with various policy regimes in order to test the effect of changing policies on the degree of financial integration.

Subhaswadikul (1995) inquires into the determinants of interest rate in Thailand based on EK model with few changes. In 1989, Thailand authorities started the formal comprehensive financial reform programs with the abolishment of the interest rate ceilings. Here the financial openness was modeled as a linear function of time with dummy variables to represent the different periods. Determination of interest rate is viewed as a function of macroeconomic factors such as anticipated inflation, unanticipated money growth and exogenous demand shocks.

EK model has also been used by Jankee (2003) to find the determinants of interest rate in Mauritius. The study cites evidence for low degree of linkages with external financial markets and the importance of internal factors in domestic interest rate determination and concludes that uncovered interest parity and Fisher relationship do not hold for the selected sample period in Mauritius.

Ahmad (2007) employs a modified version of EK model to examine financial liberalization and interest rate determination in Malaysia. By accommodating foreign reserves through its link with the money supply, the study provides a provision to check whether sterilization affects the interest rate

determination. The study concludes that external factors are more important in domestic interest rate determination before the Asian Financial crisis whereas internal factors are dominant in it after the crisis period. It also records that the domestic market is less opened with limited speed of foreign adjustment after the crisis.

3. Theoretical Framework

The proposed model is based on Edwards and Khan (1985) and a few more modifications to it suggested in Cavoli (2007), Cavoli and Rajan (2006), Berument, Ceylan and Olgun (2007) and Zilberfarb (1989). As Sri Lanka is an economy with a partially liberalized capital account, it can be treated as a semi-open economy where, according to Edwards and Khan (1985), interest rate can be modeled as the weighted average of interest rates in a fully open economy and a closed economy.

According to the standard Fisher relationship, the nominal interest rate in an economy wherein capital account is not liberalized can be expressed as:

$$i_t = rr_t + \pi_t^e \quad (1)$$

where, i is nominal interest rate, $rr$is real (ex-ante) interest rate and $\pi^e$is the expected rate of inflation. Following Edwards and Khan (1985), the real interest rate can be specified as:

$$rr_t = \rho + \gamma(\ln m_t^d - \ln m_t) \quad (2)$$

where, m^d is the desired equilibrium stock of money or the demand for money and m is the actual money stock. Thus, $(\ln m^d - \ln m)$ represents excess demand for money. γ is a parameter and $\gamma > 0$. ρ is a constant that represents the long-run equilibrium of the real interest rate. The real interest rate would deviate from its long-run value if there is monetary disequilibrium. For instance, an excess demand for money may result in a tentatively high real interest rate. In literature, this relationship is identified as "liquidity effect" (Mundell, 1963). The advantage of introducing the liquidity effect here is that it allows the real interest rate to vary in the short-run relaxing the restrictive assumption that real interest rate is always a constant. Substituting equation (2) into (1),

$$i_t = \rho + \gamma\left(\ln m_t^d - \ln m_t\right) + \pi_t^e \quad (3)$$

Equation (3) of the model allows for the possibility that real interest rate may adjust slowly, even though the Fisher relationship holds continuously. Viewed in this manner, it is allowed that the nominal interest rate may show a delayed response to monetary changes and the delay depends on the magnitude of the parameter γ.

The equilibrium demand for money can be specified as follows:

$$\ln m_t^d = a_0 + a_1 \ln y_t - a_2(\rho + \pi_t^e) + a_3\pi_t^e \quad (4)$$

Long-run equilibrium demand for money is assumed to be a function of a scale variable, real income (y), and two opportunity cost variables, namely the

expected inflation rate (π^e) and the nominal interest rate. Equilibrium nominal interest rate given by the long-run value of the real interest rate (ρ) plus the expected inflation rate (π^e) is assumed to be more appropriate in determining the long-run equilibrium demand for money than the current nominal interest rate.

Following Kwak (2001), money base of the central bank (m) is assumed to depend on net domestic assets (D) and net foreign assets (F).

$$m_t = D_t + F_t$$

Following Cavoli (2007) and Cavoli and Rajan (2006), we assume that the rate of change of money supply ($(m_t - m_{t-1})/m_{t-1} = \Delta m_t/m_{t-1}$) can be approximated as:

$$\Delta \ln m_t = \Delta d_t + \Delta f_t \quad (5)$$

where, $\Delta d_t = \Delta D_t/m_{t-1}$ and $\Delta f_t = \Delta F_t/m_{t-1}$. If complete sterilization occurs, then there will be no change in money supply or $\Delta m = 0$ so that equation (5) will reduce to $\Delta d_t = \Delta f_t$ (6)

For the case of incomplete sterilization, equation (6) can be modified as:

$$\Delta d_t = \lambda \Delta f_t \quad (7)$$

where, λ is the degree of sterilization which is equal to -1 in the case of complete sterilization. Or, the case of complete sterilization indicates that a change in foreign reserves is completely offset by an opposite change in domestic assets leaving no effect on the money supply which in turn will have no effect on the interest rate.

Substitution of equation (7) into (5) will yield

$$\Delta \ln m_t = (1 + \lambda)\Delta f_t \quad (8)$$

Then the money stock in time period *t* can be written as follows:

$$\ln m_t = (1 + \lambda)\Delta f_t + \ln m_{t-1} \quad (9)$$

Substituting equations (4) and (9) into equation (3),

$$i_t = \eta_0 + \eta_1 \ln y_t + \eta_2 \pi_t^e + \eta_3 \Delta f_t + \eta_4 \ln m_{t-1} \quad (10)$$

where,

$$\eta_0 = \rho + \gamma a_0 - \gamma a_2 \rho$$
$$\eta_1 = \gamma a_1$$
$$\eta_2 = (1 - \gamma a_2 + \gamma a_3)$$
$$\eta_3 = -\gamma(1 + \lambda)$$
$$\eta_4 = -\gamma$$

Equation (10) describes the determinants of the interest rate in a closed economy. Interest rate in a fully opened economy where capital account is fully liberalized is given by the uncovered interest rate parity relationship.

$$i_t = i_t^f + \dot{e}_t \quad (11)$$

where, i^f is the world interest rate for a financial asset of the same characteristics and $\dot{e}$ is the expected exchange rate change.

Allowing for possible delays associated with the domestic interest rate in adjusting in response to the expected exchange rate changes that may stem from various transaction costs and information lags etc., one can use a partial adjustment framework to model the interest rate parity relationship.

$$\Delta i_t = \theta\left(\left(i_t^f + \dot{e}\right) - i_{t-1}\right) \quad (12)$$

where, θ is the adjustment parameter and $0 \leq \theta \leq 1$. Equation 12 implies that a change in local interest rate is equal to only a fraction of the difference between previous period's interest rate and the sum of world interest rate and expected exchange rate change. By rearranging equation (12), we can obtain an expression for the interest rate in period t.

$$i_t = \theta\left(i_t^f + \dot{e}\right) + (1-\theta)i_{t-1} \quad (13)$$

Equation (13) describes how the interest rate in a fully open economy is determined. Interest rate in an economy where some capital controls are at work can be viewed as a weighted average of the interest rates in a closed economy and a fully open economy (Edwards and Khan, 1985).

$$i_t = \psi i_t^o + (1-\psi)i_t^c \quad (14)$$

where, i_t^o represents the interest rate in an open economy and i_t^crepresents the interest rate in a closed economy. ψ is termed as the degree of openness. Assuming that i_t^o and i_t^c are characterized by equations (13) and (10), respectively, and substituting them into equation (14),

$$i_t = \psi\theta\left(i_t^f + \dot{e}\right) + \psi(1-\theta)i_{t-1} + (1-\psi)(\eta_0 + \eta_1 \ln y_t + \eta_2 \pi_t^e + \eta_3 \Delta f_t + \eta_4 \ln m_{t-1})$$

Rearranging,

$$i_t = \delta_0 + \delta_1(i_t^f + \dot{e}) + \delta_2 \ln y_t + \delta_3 \pi_t^e + \delta_4 \ln m_{t-1} + \delta_5 \Delta f_t + \delta_6 i_{t-1} \quad (15)$$

where,

$$\delta_0 = (1-\psi)(\rho + \gamma a_0 - \gamma a_2 \rho)$$

$$\delta_1 = \psi\theta$$

$$\delta_2 = (1-\psi)\gamma a_1$$

$$\delta_3 = (1-\psi)(1-\gamma a_2 + \gamma a_3)$$

$$\delta_4 = -(1-\psi)\gamma$$
$$\delta_5 = -(1-\psi)\gamma(1+\lambda)$$
$$\delta_6 = \psi(1-\theta)$$

Finally, following Berument et al. (2007) and Zilberfarb (1989), we also assume that there is a possibility that the inflation uncertainty (σ^{π}) may also affect the interest rate. Then the model becomes;

$$i_t = \delta_0 + \delta_1(i_t^f + \dot{e}) + \delta_2 \ln y_t + \delta_3 \pi_t^e + \delta_4 \ln m_{t-1} + \delta_5 \Delta f_t + \delta_6 i_{t-1} + \delta_7 \sigma_t^{\pi} \quad (16)$$

Expected signs for the parameters δ_1, δ_2, δ_3, δ_6 and δ_7 are positive whereas the signs associated with δ_4 and δ_5 are expected to be negative.

Within the framework suggested by the proposed model given in equation (16), interest rate in a semi-open economy is assumed to be determined by world interest rate plus expected exchange rate change, real income, money stock during the previous time period, change in foreign assets, interest rate during the previous time period, expected inflation and inflation uncertainty.

Implications of a few interest rate theories are nested in the proposed model. The composite variable $(i_t^f + \dot{e})$ represents the interest rate parity relationship. y_t and m_{t-1}indicate the role of liquidity preference in interest rate determination. Finally, the presence of i_{t-1}, π_t^e and σ_t^{π} emphasizes the importance of an extended version of the Fisher relationship in interest rate determination.

4. Data

The study uses quarterly data for the sample period January 2001 to June 2012. Data has been obtained from annual reports of Central Bank of Sri Lanka, various publications of Department of Census and Statistics of Sri Lanka and the official website of the Federal Reserve Bank.

Following many studies, 91 Treasury bill rate is selected to be the measure of domestic interest rate. Narrow money supply (M1) that consists of currency and demand deposits held by the public is used as the proxy for the actual money stock. The rationale for the selection is that M1 is more sensitive to the changes in money supply than broader measures of money. Inflation rate is computed using the CCPI, the official measure of inflation in Sri Lanka.Total net foreign assets given in Central Bank annual reports are used as the measure of net foreign assets which consists of the external assets (net) of the Central Bank and commercial banks including outward bills. Both nominal GDP and net foreign assets are deflated using CCPI in order to get the real values of the two variables.

There are several measures that can be used as proxies for foreign interest rate. The first candidate is the SDR (Special Drawing Rights) rate which is an international reserve asset created by the IMF where the value is based on a basket

of four key international currencies and can be exchanged for freely usable currencies. The problem of SDR in the Sri Lankan context is that the relevant exchange rate for SDR which is Real Effective Exchange Rate (REER) is not in one base for the sample period studied and data is available only after 2003. Therefore, a second candidate, namely the US three-month Treasury bill rate is used as a proxy for the foreign interest rate. However, only the secondary market US Treasury bill rates are available for the sample period.

5. Empirical Analysis

In order to convert the proposed model in equation (16) into an estimable version, it is essential to replace the unobservable variables such as expected inflation (π^e) and expected exchange rate change ($\dot{e}$) with some observable variables. This can be done in a number of ways. Use of either adoptive or rational expectations is common in modeling expected inflation. However, to keep things simple, we use ARIMA forecasts to obtain data for the expected inflation rate. The predicted inflation rate (π') is obtained after deducting error term obtained from an appropriate ARIMA model from the actual inflation rate. Based on AIC and SIC criteria, an ARIMA (1,1,1) model has been selected for purpose. Following literature, three-month forward premium percentages (fp) are used as a proxy for the expected exchange rate change.

In order to find the inflation uncertainty data represented by the conditional variance of inflation, GARCH modeling can be used. However, as the ARCH-LM test results reveal, there is no ARCH effect in inflation data in Sri Lanka. As such, the variable σ^{π} in equation (16) is dropped and the proposed model to be estimated is represented by equation (15).

We begin the analysis with the stationarity test for all data series. Results of ADF test obtained for levels and first differences of all variables are displayed in Table 01[3]. At levels, domestic Treasury bill rate (i), US Treasury bill rate (i^f) and forward premium (fp) are not stationary. However, predicted inflation rate (π'), narrow money supply ($m1$), real GDP (y) and foreign assets (f) are stationary. At first difference, all the series are stationary. This suggests that domestic Treasury bill rate, US Treasury bill rate and forward premium are integrated of order one, or I(1), whereas expected inflation rate, narrow money supply, real GDP and foreign assets are integrated of order zero, or I(0).

These results question the use of Johansen cointegration test which requires the precondition that all the variables involved have to be integrated of the same order. As such, this study uses ARDL bounds testing approach to analyze the long-run relationship among variables involved. More importantly, ARDL bounds testing

[3] An intercept and a trend have been included in the equation for all variables.

approach does not need all variables are to be integrated of the same order (Pesaran and Shin, 1999; Pesaran, Shin and Smith, 2001).

TABLE 01
ADF Test Results

Variable	ADF Statistic
i	-2.301691
π'	-3.982369**
$m1$	-3.743125**
y	-6.730306***
Δf	-4.482645***
i^f	-2.369895
fp	-2.385409
Δi	-4.296611***
$\Delta\pi'$	-5.460512***
$\Delta m1$	-5.329308***
Δy	-5.679476***
$\Delta^2 f$	-5.681117***
Δi^f	-4.029999**
Δfp	-7.659443***

Note: ***, ** and * denote the statistical significance at 1%, 5% and 10% levels, respectively.

As the independent variables may influence the dependent variable with a lag in time series analysis, it is sensible to include lags of the independent variables in the regression. In addition, dependent variables may also be correlated with lags of itself, requiring the inclusion of the lag terms of the dependent variable in the regression as well. ARDL approach is based on this reasoning to test the long-run relationship between variables.

TABLE 02
Selection of the Lag Length

Lag value	AIC	SIC	Adj R^2
0	2.916189	3.525725	0.605519
1	3.117245	3.996977	0.530514
2	2.942670	4.098072	0.544831

As indicated in Table 02, based on AIC, SIC and adjusted R^2, the optimal lag order is found to be zero. As such, the unrestricted error correction model to be used for ARDL cointegration test can be specified as in equation (17).

$$\Delta i_t = \omega_0 + \tau_1 i_{t-2} + \tau_2 \ln m1_{t-2} + \tau_3 \ln y_{t-1} + \tau_4 \pi'_{t-1} + \tau_5 \Delta f_{t-1} + \tau_6 \left(i^f_{t-1} + fp_{t-1}\right) + \omega_1 \Delta i_{t-1} + \omega_2 \Delta \ln m1_{t-1} + \omega_3 \Delta \ln y_t + \omega_4 \Delta \pi'_t + \omega_5 \Delta^2 f_t + \omega_6 \left(\Delta i^f_t + \Delta fp_t\right) + \varepsilon_t \quad (17)$$

Restricted version of the ARDL model is given by,

$$\Delta i_t = \omega_0 + \omega_1 \Delta i_{t-1} + \omega_2 \Delta \ln m1_{t-1} + \omega_3 \Delta \ln y_t + \omega_4 \Delta \pi'_t + \omega_5 \Delta^2 f_t + \omega_6 \left(\Delta i^f_t + \Delta fp_t\right) + \varepsilon_t \quad (18)$$

The *F* statistic based on these restricted and unrestricted versions of the ARDL model turns out to be 3.47.[4] Table 03 indicates the critical *F* values obtained from Pesaran, Shin and Smith (2001) for the relevant degrees of freedom. Since the calculated *F* value lies between the lower bound and upper bound critical *F* values at even 5% significance level, it is more appropriate to conclude that there exists no cointegration relationship between the interest rate and its proposed determinants.

TABLE 03
Critical F Values of Bound Test

	90%		95%	
K = 6	I(0)	I(1)	I(0)	I(1)
	2.12	3.23	2.45	3.61

[4] Computation of the *F* statistic is as follows:

$$F = \frac{(R^2_{UR} - R^2_R)/m}{(1 - R^2_{UR})/(n-k)} = \frac{(0.6944 - 0.4819)/6}{(1 - 0.6944)/(43 - 13)} = 3.47$$

Once it is confirmed that there is no cointegrating relationship between the interest rate and its determinants, the only option left is to estimate the short-run relationship using the equation (18). Results are presented in Table 04. Foreign interest rate changes adjusted for the expected exchange rate change proxied by the changes in forward premium and the lag term of the changes in domestic interest rate seem to be instrumental in determining the changes in domestic interest rate in the short-run. The changes in other variables, predicted inflation rate, real GDP, narrow money supply and foreign assets fail to show statistically significant impact on the domestic interest rate changes[5].

TABLE 04
Results for the Short Run Relationship

Variable	Coefficient	Estimate	t-statistic
	φ_0	0.0554	0.23
$\Delta \ln m1_{t-1}$	φ_1	-0.5521	-0.11
$\Delta \ln y_t$	φ_2	-2.0287	-0.54
$\Delta \pi_t'$	φ_3	0.1997	0.19
$\Delta^2 f_t$	φ_4	0.5037	0.45
$\Delta\left(i_{t-1}^f + \dot{e}_{t-1}\right)$	φ_5	0.3284	3.89***
Δi_{t-1}	φ_6	0.2992	2.76***

Note: ***, ** and * denote the statistical significance at 1%, 5% and 10% levels, respectively.

Insignificant impact of real GDP and the money supply variable on domestic interest rate in both short- and long-run suggest that the liquidity preference framework is not helpful in explaining the behavior of the interest rate in Sri Lanka. Statistically insignificant parameter of the expected inflation rate implies that even a partial Fisher effect is not at work in determining the nominal interest rate. Significant impact of the foreign interest rate adjusted for expected exchange rate change on the domestic interest rate implies that the interest rate parity relationship comes in useful in explaining the behavior of the domestic interest rate in Sri Lanka. Furthermore, there is evidence that the interest rate changes drastically depend on its own changes in the past.

[5] The equation (18) has also been estimated using a dummy variable to capture the change in the measure of inflation rate in Sri Lanka introduced from January 2008. However, the coefficient of the dummy variable turns out to be insignificant.

6. Conclusion

This paper employed a slightly modified version of the reduced-form model suggested by Edwards and Khan (1985) in order to inquire into the determinants of interest rates in Sri Lanka. The model captures both external and domestic factors that are likely to influence the domestic interest rate. As the variables involved are not integrated of the same order, ARDL bounds testing approach is used to capture the long-run association of the interest rate and its determinants.

The results show that none of the proposed determinants has a cointegrating or long-run relationship with the interest rate. Even in the case of short-run, only the changes in foreign interest rate adjusted for expected exchange rate changes are instrumental in explaining the changes in the domestic interest rate. However, given the partially liberalized capital account and the limited dependence of the domestic interest rate on foreign capital transactions, this finding is not well supported by the empirical evidence associated with the interest rates in Sri Lanka. One possible interpretation would be that world interest rates may show a close linear association with the local rates though it does not necessarily suggest a causal relationship. In addition to the changes in foreign interest rates, the changes in past local rates are also important in explaining the current interest rate changes in Sri Lanka.

Contrary to the expectations, within the selected sample period, the changes in real GDP, narrow money supply and foreign assets do not exert any significant impact on interest rate changes in Sri Lanka. These findings confirm that, apart from interest rate parity conditions, no other interest rate theory such as liquidity preference theory and Fisher effect are useful in explaining the interest rate changes in Sri Lanka during the period in question.

References

Ahmad, M. B. (2007) "Financial Liberalization and Interest rate Determination in Malaysia", *Proceedings: Annual Conference of Malaysia Financial Association.*

Bar-Efrat, O. (1993) "Interest Rate Determination and Liberalization of International Capital Movements: Israel 1973-1990", *Journal of Economic Development*, 18(2), 171-188.

Berument, H., Ceylan, N. B., and Olgun, H. (2007) "Inflation Uncertainty and Interest Rates: Is the Fisher Relation Universal?", *Applied Economics*, 39(1), 53-68.

Cavoli, T. (2007) "Sterilization, Capital Mobility and Interest Rate Determination for East Asia", *Journal of Economic Integration*, 22, 210-230.

Cavoli, T. and Rajan, R. S. (2006) "Capital Inflows Problem in Selected Asian Economies in the 1990s Revisited: The Role of Monetary Sterilization", *Asian Economic Journal*, 20(4), 409-423.

Cooray, A. (2002) "Interest Rates and Inflationary Expectations: Evidence on the Fisher Effect in Sri Lanka", *South Asia Economic Journal*, 3(2), 201-216.

Edwards, S., and Khan, M. S. (1985) "Interest Rate Determination in Developing Countries: A Conceptual Framework", Cambridge: National Bureau of Economic research.

Fisher, I. (1930) *The Theory of Interest*, Macmillan, New York.

Gochoco, M. S. (1991) "Financial Liberalization and Interest Rate Determination: The Case of the Philippines, 1981-1985", *Journal of Macroeconomics*, 13(2), 335-350.

Hemachandra, W. M. (2009) "Interest Rate as a Policy Instrument - Recent Experience of Sri Lanka", *Staff Studies*, Central Bank of Sri Lanka, 39(1 & 2), 15-36.

Hemachandra, W. M. (2010) "Interest Rate Behavior: The Sri Lankan Case", *Journal of Multidisciplinary Studies*, 1(1), 41-53.

Hettiarachchi, W. (1976) "Interest Rates in Sri Lanka", *Staff Studies*, Central Bank of Ceylon, 6 (1), 149-172.

Jankee, K. (2003) "Interest Rate Determination in the Post-Liberalization Period in Mauritius", *Law, Management and Social Sciences*, 5, 1-18.

Keynes, J. M. (1936) *The General Theory of Employment, Interest and Money*, Cambridge University Press.

Kwack, S. Y. (2001) "An Empirical Assessment of Monetary Policy Responses to Capital Inflows in Asia Before the Financial Crisis", *International Economic Journal*, 1, 95-113.

Mundell, R. (1963) "Inflation and Real Interest", *Journal of Political Economy*, 71(3), 280-283.

Pesaran, M. and Shin, Y. (1999) "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis", in S. Storm (ed.), *Econometric and Economic Theory in the 20th Century*, Chapter 11, Cambridge University of Press.

Pesaran, M., Shin, Y. and Smith, R. J. (2001) "Bounds Testing Approaches to the Analysis of Level Relationships", *Journal of Applied Econometrics*, 16(3), 289-326.

Subhaswadikul, M. (1995) "Financial Liberalization and its Impact on Interest Rate Determination: A Case Study of Thailand". UMI Company, Ann Arbor.

Udayaseelan, T. and Jayasinghe, P. (2010) "The Validity of Fisher Hypothesis: Evidence from Sri Lanka", Proceedings*: International Conference of Business Management*, University of Sri Jayewardenepura.

Zilberfarb, B.Z. (1989) "Interest Rate Determination in a High Inflation Economy", *Journal of Macroeconomics*, 11(4), 533-549.

INVESTIGATING THE EXISTING LEVEL OF TOURISTS' DESTINATION SATISFACTION; A CASE OF TOURISTS' TRAVEL EXPERIENCE IN SRI LANKA

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Abstract

Tourists' designation satisfaction on destination attributes plays an important role in marketing tourism products and services. Therefore, determinants of tourists' destination satisfaction are an ongoing debate in academic literature since destination attributes available in different destinations are heterogeneous. Thus, the objective of this research is to provide empirical evidence on tourists' existing level of satisfaction on destination attributes in Sri Lanka. The study applies an empirical model with five destination attributes; Destination attractions, Food & Beverage Services, Tourism Price Level, Hospitality, Political and Social Factors to determine tourists' destination satisfaction in Sri Lanka. Judgmental sampling technique was utilized to select 251 tourists from seven countries who had recently visited Colombo, Galle and Kandy locations in Sri Lanka. Data were collected via a researcher administrated questionnaire. One sample T test, Mean scores and ANOVA were used to analysis the tourist destination satisfaction. Further, analysis involved statistical methods such as reliability and validity tests. The results revealed that tourist are moderately and highly satisfied with on destination attributes; destination attractions, tourism price level and food & beverage services, hospitality and social and political factors in terms of the tourists' country of origin. The implications were tourists who visited Sri Lanka were satisfied with the five attributes used for this study. Further, tourists' country of origin has impact on tourists' satisfaction with destination attributes. Therefore, tourism authorities should be strategically identified that what are the destination attributes seek by tourists' in terms of their country of origin and improve them.

Keywords: Destination Satisfaction, Destination Attributes, Sri Lanka, Tourism

1. Introduction

Tourism is a bundle of products and services offered at one particular location. Therefore, it is considered as one of the most difficult products to manage

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and market. Thus, tourists' satisfaction is one of the crucial elements in destination marketing (Dmitrovic´ et. al 2007; Alegre & Garau, 2010; Kozak & Rimmington, 2000). Kozak & Rimmington (2000) pointed out that tourists' satisfaction is a result of tourists' experience with products and services. Thus, tourists' satisfaction is an ongoing debate in academic literature since destination attributes available in different destinations are heterogeneous. Therefore, purposes of this paper are to provide empirical evidence on tourists' existing level of satisfaction on destination attributes and variability of tourist destination satisfaction in terms of tourist country of origin.

Tourism industry is one of the largest and fastest-growing economic sectors in the world. In recent decades, the interest in tourism development has increased in many regions including nontraditional tourist destinations such as Russia, China, Brazil and other South American countries. Globally, it has become a key socio economic source of generating job opportunities, enterprises, foreign exchange earnings and infrastructure development. According to UNWTO (2013) international tourism receipts grew by four per cent in 2012 with a new record of US$ 1,075 billion worth tourists' travel worldwide. Thus, intensity of competition also has increased among destinations.

In the context of Sri Lanka, tourism is one of the major contributors to the economy and society. In 2012, it has recorded one million tourist arrivals to the country for the first time in history. It was 17.5 percent increase in tourists' traffic. In terms of revenue receipts from tourism it was Rs. 132,427 million (US $ 1038.3 million) in 2012, as against Rs. 91,926 million (US $ 838.9 million). This was 44.1 per cent increase in revenue from tourism in Sri Lanka (Sri Lanka Tourism Development Authority Statistical Report, 2012). Further, airport studies show that seventy per cent of tourists who visited Sri Lanka were first time visitors and majority of them visited Sri Lanka as a holiday destination (Airport Highlight Statistics, 2011).

Developing tourism is one of the major economic development strategies in Sri Lanka. The major agendas of tourism development in Sri Lanka are 1) create an environment conducive for tourism promotion 2) attracting the potential inbound tourist markets and 3) create awareness and positive perception globally. The outcome of this is to achieve a target of twenty five million tourists within five years time period (Tourism Development Strategy, 2011). Despite tourism having the potential to provide many benefits to economy of Sri Lanka, it is highly sensitive to the regional competition arising from countries such as Maldives and India. Moreover, success of any tourist attraction has depended heavily on giving the customer what he or she wants (Strategic Direction, 2006). But, Sri Lanka is still depending on signal attribute and promoting as a "Sun and Sand" destination (Miththapala, 2012). Sun and sand destinations can be replaced since there are many destinations with same attribute (Alegre & Garau, 2010). Moreover, the higher the one's satisfaction level, the more likely he/she is to experience the product again and/or provide positive word-of-mouth advertising to friends and

family (Wiberg, 2009). Hence, determining the existing level of tourists' satisfaction has a strategic importance for promoting tourism in Sri Lanka. There are many research studies available on tourists' satisfaction, but availability of in-depth research studies on tourist satisfaction in Sri Lanka are limited (Samaranayake, 1998). Thus, this study attempts to fill this gap by addressing two research questions mentioned below.

- What is the degree of tourists' existing destination satisfaction level based on tourists' experience with five destination attributes available in Sri Lanka?
- Does tourists' level of destination satisfaction in Sri Lanka vary in terms of tourists' country of origin?

2. Literature Review and Hypothesis

2.1. Customer Satisfaction

Customer satisfaction is considered to be the core of marketing strategy. Customer satisfaction refers to the ability of a business to serve its customers according to their expectations and to maintain a long-term relationship with each customer (Arora, 2012). Satisfaction is a function of the closeness between expectations and product's perceived performance (Kotler & Keller, 2009). Innario & Piccolo (2010) identified customer satisfaction as an indicator of individual's perception on a particular attribute. These definitions point out that it is a judgment or perceptual measure of the fulfillment of need. This implies that satisfaction is a feeling towards a product or service.

2.2. Tourists' Destination Satisfaction

A tourist is a temporary visitor to a place. When people leave their usual place of residence and work to have a change from their usual routine for a short time, they are called tourists. Further, international tourists are the people travelling from one country to another country, crossing the tertiary boarders (Roday, Biwal & Joshi, 2011). Globalization has made it much easier for tourists to find a destination or attraction that best fulfills their requirements. Thus, customer satisfaction has never been more important than today. The satisfied customer spreads the gospel, visitor numbers rise and everyone lives happily ever after. The reverse is, of course also true. The success of any tourist attraction has depended heavily on giving the customer what he or she wants (Strategic Direction, 2006). The higher the one's satisfaction level, the more likely he/she is to experience the product again and/or provide positive word-of-mouth advertising to friends and family (Wiberg, 2009).

Further, the past research evidence suggest that tourist satisfaction is measured using different dimensions such as destination attributes, previous experience, motivations, destination image, culture and heritage, novelty seeking adventure etc. The reason behind measuring tourists' satisfaction by evaluating different attributes is that tourism is a bundle of tourist product and services offered in one location (Manueir & Camelis, 2013; Trunfio, Petruzzellis & Nigro, 2006).

Therefore, it is a combination of many actors, factors, physical and human environment. Therefore, this indicates that there is no universally accepted method of measuring tourist destination satisfaction.

The destination satisfaction is measured on performance of its attributes (Kozak & Rimmington, 2000). Pawitra & Tan (2003) found that on the strong and weak attributes in Singapore in terms of Indonesian tourist satisfaction and they identified that price level, accommodations, transportation infrastructure are mostly considered by tourists. Trunfio, Petruzzellis & Nigro (2006) suggest that attitude of foreign tourists in choosing Southern Italian destinations is influenced not only by seaside location and cultural products but also by alternative features such as natural resources and enogastronomic traditions, which represent the differentiating and value-creating elements of the basic product. Tourist motivation on dine out while they are on holiday depends on five factors such as indulgence, relaxation and comfort, experience, social reason, discovery and health (Sparks et. al 2003). It goes without saying that safety and security is clearly linked to inbound tourism well-being just to "stay in the game." This is especially important in developing-regions that suffer from political instability or governmental inefficiencies, which can often result in high crime rates and stunted economic development (World Travel and Tourism Report, 2013). Further, visitors expressed a low level of satisfaction with quality of food and accommodation available in the area. Visitors felt that much could be done to improve cleanliness and hygiene at the Temple and in the surrounding area in India (Balakrishnan, Nekhili, & Lewis, 2011). This implies that food, cleanliness and hygiene are the factors considered by the tourists. Asian travelers are more concerned with value for money services, while Western travelers perceive security and safety as major factors, especially after September 11. Further, both Asian and Western travelers concerned about food and beverage, hospitality, recreation, supplementary service, accommodation, location, transportation and security and safety of the hotels selected (Poon & Low, 2005). To create the emotional bond with a place three factors are impacting as prior experience at the destination, characteristics of the destination, and tourist involvement (Alegre & Garau, 2010).

In the context of Sri Lanka, Sri Lanka's tourist attractions show a regional breakdown: the south coast for its beaches, the central hills for its scenery and cool climate, the north central area for historical and cultural heritage, and the western areas for more urban landscapes. Natural attractions such as wildlife parks or forest systems are also a part of Sri Lanka tourism attractions and offer a rich diversity across the country (Fernando & Meedeniya, 2009). Furthermore, Cooray (2009) has stated that seventy five percent of the tourists who visited cultural/heritage destinations in Sri Lanka were satisfied. More than eighty percent of the tourists, who have visited ancient heritages, responded as they are interested with upcountry locations such as Kandy, Gampola, Dambadeniya. The tourists particularly enjoyed the architecture, which together with the traditions of the villages and jungles create an attractive physical environment and atmosphere. The shopping facilities were

also well liked and local people were regarded as friendly. In 2011, tourism in Sri Lanka was promoted in three dimensions such as authenticity, compactness and diversity of Sri Lanka using eight types of experiences such as beaches, heritage, scenic, wildlife, festivals, essence, bliss, sports and adventure. Further, beauty and diversity of scenery, warmth and hospitality of the people were also identified as attractions to many visitors (Kirialle, 2011). Moreover, Airport report (2011) indicated that tourists' first preferences of visiting Sri Lanka are sun and beach followed by historic sites. Furthermore, around fifty nine per cent of the foreign tourists perceived Sri Lanka as a beautiful country, while fifty seven per cent tourists mentioned Sri Lankans as being 'nice people' by providing more evidence on destination attractions and hospitality. Therefore, destination attractions and hospitality can be identified as main destination attributes to measure tourists' satisfaction in Sri Lanka. Further, Airport Statistical Report (2011) identifies that fifteen per cent of the respondents perceived it as being 'A Country with Political Problems and Violence'. More than one third of the respondents had been approached by three wheel drivers, beggars, street and beach vendors, touts and beach boys about which most of the respondents commented unfavorably. Furthermore, tourists were also concerned about the environmental pollution. Some respondents were unhappy about the variation of foods and standard of the hotels. Thus, this indicates that periodic investigations are carried out on tourist perception on different destination attributes. But, this periodic information is not utilized to derive a conclusion on their contribution to in depth studies on overall satisfaction (E.g.: Samaranayaka, 1998). Furthermore, tourists have criticized the political state, food services and some social issues in Sri Lanka. Travellers' satisfaction or dissatisfaction at different stages of complex and multifaceted travel experience is likely to influence their overall satisfaction or dissatisfaction with travel and tourism services (Neal and Gursoy, 2008). Thus, this shows that destination attractions, food and beverages, prices, hospitality' and political and social factors are crucial ones affecting on tourists' satisfaction. Therefore, based on the literature, the attributes to measure tourists destination satisfaction are identified as Destination Attractions, Food and Beverages, Price, Hospitality, Political and Social factors.

Destination Attractions: Representation of the beauty of nature is one of the attributes which attracts and satisfies tourists (Nelson, 2005). Coastal tourism destinations, traditionally supplying the product sun and beach, have been facing problems resulting from the strong seasonality (Valle, 2011). Further, most of the tourists seek beaches and sunshine, quality of accommodations, quality of urban setting, climate, beautiful sceneries and quality of the environment, cleanliness of public areas in the destinations (E.g. Alegre & Cladera, 2009; Wiberg, 2009; Cho, 2008; Barutcu et al. 2011).

Food and Beverages: Food reflects a country's culture and its people (You & Back, 2007). The cuisine of the destination is an aspect of utmost importance in the

quality of the holiday experience (Global Report of Food Tourism, 2012). Poon & Low (2005) stated that Fresh food, Hygiene of food, Variety of Food, Accessibility of Food, and Food promotions are the facts sought by tourists. Du Rand et. al. (2001) identifies that food plays a major role in tourism. It is primarily considered as a supportive attraction for tourism (Du Rand, 2006). Positive emotions are aroused by sensual arousal. Thus, various service, ambiance, and food related factors all play an important role in arousing sensual stimulation which has a direct impact on emotions and satisfaction (Arora, 2012). According to Heung (2000) availability of food and beverage variety, food and beverage quality, hygiene of food and beverage, food and beverage value for money are taken into consideration.

Tourism Pricing: Tourism price is an important attribute, sought by tourists (E.g. Hartman et al. 2010, Ladhari, 2009; Uzama, 2008). The price of food and beverages, price of leisure activities, price of air fare, price of accommodations, price of local transport, price paid in shopping are mostly considered by the tourists when they visit a destination (Uzama,2008; Alegre & Cladera, 2009; Belenkiy & Riker, 2013; Masiero & Nicolau, 2012; Maunier & Camelis, 2013; Poon & Low, 2005). Cost of tourism in China and competing destinations is the crucial factor that determines the demand for tourism. It is worth noting that Asian travelers are exclusively concerned with the value for money services. Asian travelers tend not to spend much on accommodation as compared to Western travelers (Poon & Low, 2005).

Hospitality: Hospitality is the most influential factor in determining the overall satisfaction level for both Asian and Western traveler (Poon & Low, 2005). Hospitality is increasingly popular as a generic title for different sectors of the hotel and restaurant, and tourism (Ottenbacher, Harrington, & Parsa, 2009). Western travelers regard security and safety as important factors for them to stay in the hotels or revisit the country. Security and safety is a major factor for Western travelers. There is a considerable growing concern for their safety in choosing Malaysia as their destination, especially after the September 11 (Poon & Low 2005; Solomon, 2007). Thus, tourists evaluate their satisfaction on hospitality while travelling by evaluating perceived treatment they received, safety, and hospitality of the local residents (Algre and Caldera, 2009).

Political and Social Factors: Political and social factors have an impact on tourists' destination satisfaction. But the success of tourism would not be established always in a stable environment (Ritcher, 1999). Political factors influence on security of the travelers. Therefore, satisfaction level varies with political situation of a country (Maunier & Camelis, 2013). According to Reisinger & Turner (2002) social factors such as cultural values, rules of social behavior, and perceptions of service are important factors influencing and describing the tourism constructs influencing social contacts and level of tourists' satisfaction. Thus,

perception on political system of the country, power and water saving, environmental protection, equal opportunities to different nationalities were assessed to measure the political and social state of a destination (Maunier & Camelis, 2013; Kozak & Rimmington, 2000).

Based on the literature explained above, the hypotheses of the study were developed.

H_1: There is a high level of tourists' satisfaction with destination attributes such as Destination Attractions (DA), Food Services (FS), Tourism Price (TP), Hospitality (HS), Political and Social Factors (PS) in Sri Lanka.

H_2: Tourists' satisfaction on Sri Lanka varies in terms of tourists' country of origin.

3. Methodology

3.1. Research Design and Data Collection

The research design is a conclusive, single cross sectional descriptive in nature. This study attempted to investigate the tourists' existing level of satisfaction in Sri Lanka as a tourist destination and the degree of influence of the tourists' country of origin on tourist destination satisfaction. Therefore, quantitative approaches were adopted to measure the tourist destination satisfaction construct and variation of tourists' satisfaction in terms of tourists' country of origin.

The research questionnaire was initially developed and a pilot survey was carried out on a sample of 60 foreign tourists (n = 60) from seven countries. Data for this study were collected using an electronic questionnaire administrated online during 15th November 2013 to 30th November. Results of the pilot test were used to make improvements to the final survey questionnaire where appropriate. The changes were indispensable for the final questionnaire. Then four hundred (n = 400) questionnaires were distributed among tourists visiting Colombo, Kandy and Galle locations in Sri Lanka during four weeks period in the month of December 2013 to generate the final sample. Two hundred and fifty one questionnaires were returned (n=251) resulting in average response rate of 63%. Non random, judgmental sampling technique was used to select the participants due to the difficulties. Thus, it is important to note that the data for this study were collected based on tourists country of origin (Assaker, Vinzi and O' Connor, 2011). Therefore, seven nationalities (India, United Kingdom, Maldives, Russia, Germany, France, and China) were selected after screening tourist arrivals statistics published by the Sri Lankan Tourist Board in 2012. The questionnaire was administrated by tour guides. Further, the researcher also administrated the questionnaire to collect data.

3.2. Operationalization

Tourists' destination satisfaction (TDS) was operationalized by using multi attributes such as Destination Attractions (DA), Food & Beverage Services (FBS),

Tourist Price Level (TPL), Hospitality (HS) and Political and Social Factors (PSF). Then, indicators were developed to measure each dimension of the TDS construct. DA was measured using eight (08) indicators, FBS was measured using six (06) indicators, TPL using six (06) indicators, HS was measured by four (04) and PSF were measured by five (05) indicators . Therefore, initially there were twenty nine (29) indicators developed to measure the tourists' destination satisfaction (Appendix I). Each dimension was measured using non comparative itemized 7 point scale (1 = highly dissatisfied, 2= dissatisfied, 3 = somewhat dissatisfied, 4 = neither satisfied nor dissatisfied, 5 = somewhat satisfied, 6 = satisfied, 7= highly satisfied) and participants were instructed to state their degree of agreement on each statement. Two items such as "Easiness to access to the destination attractions" in destination attractions and "equal opportunities for different nationalities in Sri Lanka" in political and social factors were removed from the instrument after factor analysis was conducted using pilot survey data and the instrument was redefined for final study. Finally 27 indicators were generated to measure the destination satisfaction construct.

In addition to that, three items (03) were generated to measure tourists' demographic characteristics such as respondents' country of origin, age, gender. Furthermore, four items (04) were included in the questionnaire to measure the tourists' travel characteristics such as how tourists found out about Sri Lanka, what influenced them to visit Sri Lanka, length of stay and number of visits to Sri Lanka.

4. Data Analysis

4.1. Validation of Measurement Properties

In the first phase of the analysis, psychometric properties were validated. It is important to ensure accuracy and applicability of the research instrument (Malhotra, 2007; Sekaran & Bougie, 2010).

Face Validity: At first, face validity of the indicators of destination satisfaction construct was obtained. In this study, all the psychometric properties to measure the destination satisfaction construct were taken from preceding literature validated by past research studies. Further, these psychometric properties were tested in allied contexts of tourism in developing and developed countries. Therefore, the measurement properties of destination satisfaction construct dimensions demonstrate strong face validity.

Unidimensionality: Unidimensionality of each construct was assessed individually using exploratory factor analysis. Therefore, before conducting the factor analysis, sampling adequacy and Sphericity were employed in order to assess the ability of factorization. According to factor analysis, destination satisfaction was measured by Destination Attractions (DA), Food & Beverage Services (FBS), Tourist Price Level (TPL), Hospitality (HS) and Political and Social Factors (PSF). The factor

analysis ensures that indicators developed to measure each dimension were unidimensional.

Reliability: Table 01 shows the Crobach Alpha (α) value estimation for each dimension of destination satisfaction. Reliability estimation (α) for all the dimensions of tourists' destination satisfaction construct was found as higher than the threshold level ($\alpha > 0.7$). Therefore, it can be concluded that adequate internal consistency exists with destination satisfaction dimensions.

TABLE 01
Construct Reliability

Dimension	Cronbach Alpha	No. of Items
DA	0.824	7
FS	0.794	6
TP	0.803	6
HS	0.742	4
PS	0.748	4

Convergent Validity: Table 02 shows Composite Reliability (CR) estimation and Average Variance Extracted (AVE) values for destination satisfaction dimensions (DA, FBS, TPL, HS and PS). The calculated CR values for destination satisfaction construct dimensions' (DA, FS, TP, HS and PSF) were greater than AVE values. It indicates that psychometric properties of tourists' destination satisfaction construct's dimensions were positively correlated. Thus, destination satisfaction construct dimensions demonstrate a good convergent validity.

TABLE 02
Results of Sampling Adequacy Sphericity and Convergent Validity

Dimension	Sampling Adequacy	Sphericity Bartlett's Test		Convergent Validity		No. of Items
	KMO Test	Chi. Square	Sig.	CR	AVE	
DA	0.728	504.718	0.000	0.700	0.657	7
FBS	0.705	319.041	0.000	0.714	0.648	6
TPL	0.774	340.107	0.000	0.730	0.690	6
HS	0.624	267.039	0.000	0.728	0.638	4
PSF	0. 701	169.969	0.000	0.746	0.650	4

Discriminant Validity: Discriminant validity was tested to ensure the theatrically un-relatedness of the indicators. Table 03 revealed the AVE estimates and Shared variance ($r^{\wedge 2}$) estimations. Further, Table 03 shows that AVE values of DA construct's dimensions were greater than the shared variance values. Therefore, discriminant validity is supported for DS construct dimensions.

TABLE 03
Discriminant Validity

Variable	Shared Variance					AVE	No. of Items
	DA	FS	TP	HS	PS		
DA	0.657					0.657	7
FBS	$0.284^{\wedge 2}$ 0.227	0.648				0.648	6
TPL	$0.402^{\wedge 2}$ 0.308	$0.440^{\wedge 2}$ 0.339	0.690			0.690	6
HS	$0.341^{\wedge 2}$ 0.205	$0.186^{\wedge 2}$ 0.141	$0.329^{\wedge 2}$ 0.194	0.628		0.638	4
PSF	$0.133^{\wedge 2}$ 0.063	$0.195^{\wedge 2}$ 0.058	$0.068^{\wedge 2}$ 0.073	$0.198^{\wedge 2}$ 0.270	0.650	0.650	4

4.2. Sample Profile

The first phase of the data analysis shows sample profile of the study. Table 04 shows demographic characteristics of the respondents such as tourist country of origin, gender, age and four travel characteristics such as how tourists' find out Sri Lanka as a holiday destination (holiday brochure, recommendations, internet and advertisements), what factors influenced them to visit Sri Lanka (recommendation, to explore something new, previous experience and on my way to some other destination) number of previous visits to Sri Lanka and how many days they stayed in Sri Lanka.

4.3. Measuring Tourists' Existing Level of Satisfaction

This model consists of five multiple independent variables. They are Destination Attractions (DA), Food Services (FS), Tourism Price (TP), Hospitality (HS), Political and Social Factors (PS) and one dependent variable; Tourists' Destination Satisfaction (TDS). Table 05 shows the average satisfaction of the respondents as follows.

TABLE 04
Demographic and Travel Behavior Characteristics of the Sample

Demography/ Travel Behaviour		Number of Respondents	Percentage (%)
Country	India	92	36.7
	United Kingdom	57	22.7
	Maldives	24	9.6
	Germany	30	12
	France	26	10.4
	Russia	12	4.8
	China	10	4
Gender	Male	144	57.4
	Female	107	42.6
Age	20 -29	45	17.9
	30- 39	71	28.3
	40- 49	72	28.7
	50-59	40	15.9
	60-69	23	9.2
Find out about SL	Holiday broacher	29	11.6
	Internet	18	7.2
	By recommendations	197	78.5
	Advertisements	7	2.5
Influence to Come	By recommendations	114	45.4
	To explore something new	89	35.5
	Previous experience	46	18.3
	On way to…	2	0.8
No. of Previous Visits	No. Previous Visits	155	61.8
	One	35	13.9
	Two	33	13.1
	Three	11	4.4
	Four	9	3.6
	Five	3	1.2
	Six	4	1.6
	Seven	1	0.4

(Table 04 continued)

(Table 04 continued)

No. of Days Stayed	2 days	6	2.4
	3 days	7	2.8
	4 days	16	6.4
	5 days	4	1.6
	6 days	1	0.4
	7 days	8	3.2
	9 days	19	7.6
	10 days	61	24.3
	12 days	44	17.5
	14 days	54	21.5
	15days	1	0.4
	19days	8	3.2

TABLE 05
Mean Scores for Dimensions of Destination Satisfaction Construct

Dimension	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic
DA	3.43	7.00	5.6927	.64474
FBS	3.33	7.00	5.8493	.61153
TPL	3.17	7.00	5.8108	.64026
HS	3.25	7.00	5.5030	.71711
PSF	1.60	6.60	5.0797	.84873

According to the results presented in Table 05, mean scores and standard deviation values of destination satisfaction construct dimensions were as follows; for DA (5.69,0.64), for FBS (5.84, 0.61), for TPL (5.81, 0.64), for HS (5.50,0.71) and for PSF (5.07,0.84). This indicated that mean values of all the dimensions of the destination satisfaction were over 5 on the measurement scale. Further, the standard deviation scores show high variation in tourists' perception on hospitality and political and social factors. Therefore, this indicates that tourists from different countries had different opinions on hospitality and political and social factors in Sri Lanka.

Further analysis on tourists' existing level of satisfaction was conducted based on overall satisfaction mean score responses (Table 05). Thus, Table 06 depicts breakdown of overall tourists' satisfaction on destination attributes into three categories such as "Low", "Moderate" and "High" based on the mean scores.

TABLE 06
Mean Value Range

Mean Value Range	Level of Satisfaction
1- 3.59	Low
3.6 – 5.59	Moderate
5.6 – 7	High

Table 07 shows the number of the tourists belonged to each satisfaction levels. Referring to Table 07, 106 (42.2%) tourists were having a moderate level of destination satisfaction while 145 (57.8%) tourists were having a high level of satisfaction. This concludes that majority of the tourists are in the range of satisfied to highly satisfied. Further, some tourists have neutral or moderate level of satisfaction while no respondent has indicated the low level of destination satisfaction.

TABLE 07
Tourists' Existing Level of Satisfaction

Level of Satisfaction	Number of Tourists	Valid Percent
Low	0	0
Moderate	106	42.2
High	145	57.8
Total	251	100

4.4. Tourists Satisfaction with Destination Attributes

Table 08 shows the results of the one sample t test employed to investigate the tourists' satisfaction with destination attributes.

As shown in Table 08 t values of the dimensions of the destination satisfaction construct at the test value of '4 = neither satisfied nor dissatisfied' which is the neutral point of the seven point scale. Referring to Table 08 destination attractions (DA) = 41. 59, Food and beverages (FBS) = 47.90, Tourism price level (TPL) = 44.81, Hospitality (HS) = 33.205, Political and social factors (PSF) = 20.15 at the significant level of 0.000 ($p \leq 0.05$). Thus, mean values of all dimensions exceeded the neutral point of 4. Hence, null hypothesis is rejected. Thus, tourists' satisfaction with destination attributes such as destination attractions, food and beverages, tourism pricing, hospitality, political and social factors available in Sri Lanka was greater than assumed tourists' satisfaction mean score (μ =4). Therefore, it can be concluded that tourists have a high level of satisfaction

with destination attributes such as destination attractions, food and beverages, tourism pricing, hospitality, political and social factors available in Sri Lanka.

TABLE 08
One Sample T Test

Item	Test Value = 4						
	T	df	Sig. (2-tailed)	Mean Values	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
DA	41.593	250	0	5.69	1.69266	1.6125	1.7728
FBA	47.909	250	0	5.85	1.84927	1.7732	1.9253
TPL	44.806	250	0	5.81	1.81076	1.7312	1.8904
HS	33.205	250	0	5.5	1.50299	1.4138	1.5921
PSF	20.154	250	0	5.07	1.07968	0.9742	1.1852

4.5. Tourists' Level of Destination Satisfaction in terms of Tourist Country of Origin

The correlation analysis indicated that there is positive association of DA($r = 0.657$, $p < 0.01$), FS ($r = 0.632$, $p < 0.01$), TP($r = 0.669$, $p < 0.01$), HS($r = 0.647$, $p < 0.01$), PS ($r = 0.569$, $p < 0.01$) with TDS. This indicated that there is positive association between dimensions of tourists' destination satisfaction (DA, FS, TP, HS, PS) and tourists' destination satisfaction. Table 08 depicts results of one – way ANOVA between groups analysis of variance for Tourist Destination Satisfaction (TDS) construct. ANOVA was performed in order to identify the mean differences in tourists' existing level of satisfaction by the country of origin of the respondents. The result of ANOVA, F statistic is 15.45 at significant level of .000 ($p \leq 0.05$). Hence H_2 was rejected. Thus, it can be concluded that there is a high level of tourists' satisfaction with destination attributes available in Sri Lanka such as Destination Attractions (DA), Food & Beverage Services (FBS), Tourism Pricing Level (TPL), Hospitality (HS), Political and Social Factors (PSF) and overall tourists' destination satisfaction (TDS) irrespective of their country of origin .

Further, as shown in Table 09,Chinese tourists reported the lowest satisfaction mean scores for TDS construct, supporting the notion that Chinese nationalities may have lower destination satisfaction levels than other sample groups. Moreover, tourists from UK reported the highest satisfaction scores. Further, Chinese tourists reported the lowest mean scores for DA (4.94), FBS (5.05), TPL (4.31), HS (4.57), PSF (4.5) whereas tourists from UK reported the highest satisfaction scores for DA (6.28), FBS (6.02). All the countries other than

China had indicated a higher satisfaction level. Maldives have the highest satisfaction mean score for TPL (6.35).

TABLE 09
Tourists' Level of Satisfaction across the different Nationalities (ANOVA)

Item	Mean Satisfaction Scores								F	Sig. ($p \leq 0.05$)
	India	Maldives	UK	France	Russia	China	Germany	Total		
DA	5.42	5.86	6.28	5.55	5.81	4.94	5.59	5.69	19.75	0
FS	5.92	5.85	6.02	5.54	5.81	5.05	5.81	5.85	5.56	0
TP	5.82	6.35	6.15	5.13	5.79	4.31	5.78	5.81	36.19	0
HS	5.55	5.86	5.42	5.53	5.85	4.57	5.36	5.5	3.16	0
PS	5.35	4.52	5.08	5.04	4.75	4.5	5.01	5.07	4.87	0
TDS	5.62	5.69	5.79	5.36	5.6	4.68	5.51	5.59	15.45	0

5. Discussion and Conclusion

Chang (2008) stated that many researches deemed that consumers' emotional responses are linked to satisfaction and dissatisfaction judgments. By obtaining quantitative estimates on importance of each attribute with tourist satisfaction levels provides statistically valid assessment across different locations. Further, it provides useful information for decision making parties regarding tourism development (Enright & Newton, 2005). Thus, objectives of the study were to investigate whether there is a significant difference in tourists' existing level of satisfaction in Sri Lanka and to examine whether tourists' destination satisfaction varies in terms of tourists' country of origin. Yoon and Uysal (2005) stated that tourists' destination satisfaction plays an important role in planning marketable tourism products and services for a destination. Further, the assessment of destination satisfaction ought to be a basic parameter used to evaluate the performance of destination products and services. Alegre and Garau (2010) stated that tourist's feeling of place attachment is created by identifying symbolically or emotionally with a time a tourist spent in particular location. Thus, Destination Attractions, Food and Beverage services, Tourism Pricing, Hospitality and Political and Social factors seem to be more important from the point of view of tourists during the time they spend in Sri Lanka. Therefore, the factors which strongly contribute for tourists overall satisfaction should be carefully monitored (Maunier and Camelis, 2013). Moreover, analyzing the antecedents of customer satisfaction provides insight on the process of creating satisfaction at both the construct and

indicator levels. Therefore, to plan and deliver a delighted travel experience in Sri Lanka, these attribute level satisfactions can be used. Further, it can be used to understand how well tourism products and service providers at a particular destination are able to recognize and respond to the needs of its customers and which attributes destinations offer need to be improved. Hence, tourists' comments, complaints and suggestions are a valuable source of information for improvements and innovations.

Further, mean scores of tourists' overall satisfaction was categorized into three categories as "Low level of Satisfaction" "Moderate level of Satisfaction" and "High level of Satisfaction". The findings show that there are no responses received under "Low level of Satisfaction". 42.2 per cent of the tourists were moderately satisfied and 57.8 per cent of tourists had a high level of overall satisfaction. This implies that tourists who visit Sri Lanka are either moderately or highly satisfied with five destination attributes utilized in this study. Rayan (1991b) cited in Buhalis (2000) stated that for the survival of tourism in a particular destination, carefully monitoring tourist satisfaction levels and using those information as a part of the criteria for success are more important than increasing the number of tourists. Thus, this points out that for the survival in the existing business, the overall satisfaction level can be used as a criterion for improving quality in tourism experience delivery. Therefore, this study indicates that improvement in destination attractions, food and beverage services, tourism pricing, hospitality, and political and social factors is required for future success of tourism industry in Sri Lanka. Therefore, implication of this study was that tourists' level of satisfaction with each attribute has to be considered when formulating tourism strategies.

Further, the second objective was to investigate whether tourists' satisfaction on Sri Lanka varies in terms of the tourists' country of origin. The results indicated that, in the context of Sri Lanka, the highest overall satisfaction level exists among UK tourists while the lowest overall destination satisfaction is possessed by Chinese travelers. Further, tourists' satisfaction levels in Sri Lanka vary in terms of their satisfaction with certain attributes and vice versa. Kamata, Misui & Yamauchi (2009) in their study stated that the attractiveness diverges as openness of the destination or cost depending on the origin of each consumer. Further, supporting the fact regarding UK tourists, European travelers such as French, English, and German individuals travel mostly outside of their own countries (Alegre & Cladera, 2006). Supporting that, this study indicated that majority of tourists who come to Sri Lanka seek destination attractions and tourism pricing irrespective of nationality. Tourism product is a combination of many products and services. Therefore, as a result of one or two factors, overall satisfaction can be deterred (Neal & Gursoy, 2008; Alegre & Garue, 2009). Further, the study reveals that the importance of destination promotion institutes to identifying the importance of attributes vary according to the nationality. Previous destination satisfaction surveys have identified that some are specific and some are generic (Kozak & Rimmington., 2000; Poon & Low, 2005). E.g: tourism pricing

considered to be the most influencing attribute in Sri Lanka for all nationalities while hospitality is for mostly for Chinese tourists. Therefore, tourism pricing should be in affordable standard but all of them will not accept that pricing procedure.

The demographic characteristics indicated that most of the tourists visiting Sri Lanka are from Asian countries like India and Maldives. Further, the majority of the tourists are male tourists (Neal & Gursoy, 2008; Li & Cai, 2011) and majority were in the age range of 30 to 49. In contrast to this study, majority of tourists belonged to the age range of 24 to 35 (Li and Cai, 2011). The majority was first time visitors (Alegre & Garau, 2009) and the word of mouth recommendation is the strongest mode of tourism promotion. Therefore, this indicates that in-depth studies on tourists' demographic variables, travel characteristics with destination attribute satisfaction have to be continuously established in order to promote Sri Lanka as a destination.

The significance of this study is mainly to the tourism business organizations and tourism policy makers since it is important to understand the determinants of tourists' existing level of satisfaction in Sri Lanka. Tourists' satisfaction is also significant on generating positive word of mouth recommendation. Understanding what makes experiences satisfactory and pleasant is a significant challenge for tourism managers who seek to design and deliver a memorable experience that encourages people to recommend their destination and want to revisit (Mounier & Camelis, 2013).

The evidence advocates that destination managers should segment tourists according to their tendency to seek variety in their choice. Moreover, this study measured tourists' satisfaction in Sri Lanka based on their country of origin. Therefore, in future, tourists' existing level of satisfaction can be further investigated as a comparison of the satisfaction levels among Asian tourists and European tourists. Furthermore, in depth investigation of each nationality can be carried out. Further, the study was limited to five dimensions identified on literature. Thus, future research opportunities available to identify other attributes specific to Sri Lanka.

The limitations of the study are relating to the scope of the study which represents the satisfaction levels of seven nationalities. There is a trend of increasing tourists from Middle East countries and South American countries. This is not addressed due to the fact that sampling procedure was based on the most highly visiting seven nationalities. Further, the study was conducted using a structured questionnaire. Therefore, psychological and behavioral implications on destination attributes could not be captured in the study. The study was carried out at the moment of departing or just after finishing their tour. Therefore, post purchase evaluation and its impact was not included in the study. Further, the number of respondents was selected based on researcher judgment by observing the tourist arrival statistics in 2012. Therefore, number of tourists from Germany, Russia, and China were very low compared with respondents from India. Further,

limitation is the lack of formally recorded sources of past research studies on tourism industry in Sri Lanka. Thus, it has limited of getting good insight on tourism market in Sri Lanka specially on identifying destination attributes.

References

Alegre, J. & Cladera, M. (2009). Analysing the Effect of Satisfaction and Previous Visits on Tourist Intentions to Return. European Journal of Marketing. 43. Retrieved from: http://www.popsci.com/popsci37b144110vgn/html.

Alegre, J., & Garau, J. (2010). Place Attachment in Sun and Sand Destinations. QualityTechnology and Quantitative Management, Retrieved from: http://www.popsci.com/popsci37b144110vgn/html.

Balakrishnan, M. S., Nekhili, R., & Lewis, C. (2011). Destination Brand Components. International Journal of Culture Tourism and Hospitality, 5, http://dx.doi.org/10.1108/17506181111111726.

Belenkiy, M., & Riker, D. (2013). Modeling the International Tourism Expenditures of Individual Travelers. Journal of Travel Research, 52, 202–211. doi:10.1177/0047287512461180.

Boylu,Y., Tasci, A. D. A., & Gartner, W. C. (2009). Worker and consumer face-off on cultural distance and satisfaction. Tourism Review, 64, 37–52. doi: http://dx.doi.org/10.1108/16605370911004566.

Dmitrovic, T., Cvelbar, L. K., Kolar, T., Brencic, M. M., Ograjensek, I. & Zabkar,V., (2009). Conceptualizing tourist satisfaction at the destination level. European Journal of Marketing, 3, 116-126. doi: http://dx.doi.org/10.1108/17506180910962122.

Fernando, K., & Meedeniya, A. (2009). Recent changes in tourism trends in Sri Lanka and implications for poverty reduction. Retrieved from http://www.cepa.lk/AR2009/docs/ADB_Povnet_tourism%20Paper.pdf.

Hartman, K. B., Mayer, T., & Hurley, H. (2010). An examination of culture cushion: antecedents and consequences. International Journal of Culture, Tourism, and Hospitality Research,7, 340 -352. doi: http://dx.doi.org/10.1108/IJCTHR-12-2011-0002.

Iannario, M., & Piccolo, D., (2010). A New Statistical model for the Analysis of Customer Satisfaction. Quality Technology and Quantitative Management, Retrieved from http://www.popsci.com/popsci37b144110vgn/html.

Jani, D., & Han, H. (2013). Personality, social comparison, consumption emotions, satisfaction and behavioral intentions: how do these and other factors relate in a hotel setting?. 25, 970–993. doi: http://dx.doi.org/10.1108/IJCHM-10-2012-0183.

Kozak, M., & Rimmington M. (2000). Tourist Satisfaction with Mallorca, Spain, as an Off-Season Holiday Destination. Journal of Travel Research, 38, 260-69.doi:10.1177/ 004728750003800308.

Maunier, C., & Camelis, C. (2013). Toward an identification of elements contributing to satisfaction with the tourism experience. Journal of Vacation Marketing,19, 19-39. doi: 10.1177/1356766712468733.

Pantouvakis, A. (2013). Travelers' behaviour intentions depending on their beliefs: an empirical study. International Journal of Quality and Services Science, 5, 4–18. doi: http://dx.doi.org/10.1108/17566691311316211.

Michael, J. E., & Newton, J. (1995). Determinants of Tourism Destination Competitiveness in Asia Pacific: Comprehensiveness and Universality. Retrieved from http://www.estig.ipbeja.pt/~aibpr/Ensino/EngDesenvTur/.../AsiaStudyCase.pdf.

Miththapala, S. (2012, September 18). Emerging Tourism Trends. Daily Mirror, Retrieved from www.dailymirror.lk.

Pawitra, T. A., & Tan, K.C. (2003). Tourist satisfaction in Singapore – a perspective from Indonesian tourists. Managing Service Quality, 13, 399-411. doi: http://dx.doi.org/10.1108/09604520310495868.

Pritchard, M. P., & Havitz, M. E. (2006). Destination appraisal. An analysis of critical incidents. Annals of Tourism Research, 33, 25-46. doi: http://dx.doi.org/10.1016/j.annals.2005.03.002.

Richter. L. K. (1999). After Political Turmoil: The Lessons of Rebuilding Tourism in Three Asian Countries. Journal of Travel Research, 38, 260-41. doi: 10.1177/004728759903800109.

Samaranayake, H. M. S. (1998). Development of tourism in Sri Lanka and its impact on the economy and society.1st ed. Sri Lanka Institute of Social and Economic Studies, Sri Lanka.

Schiffman, L. G., & Kanuk, L. L. (2007). Consumer Behaviour. 9th ed. New Delhi: Rajkamal Electric Press.

Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A Skill Bulilding Approach. 4th ed. New Delhi: Wiley India (P.) Ltd.

Malhotra, N. K. (2007). Marketing Research: An Applied Orientation. 5th ed. India: Rekha Printers Private Ltd.

Trunfio, M., Petruzzellis, L., & Nigro, C. (2006). Tour operators and alternative tourism in Italy Exploiting niche markets to increase international competitiveness. 18, 426–438. doi: http://dx.doi.org/10.1108/09596110610673556.

Uzama, A. (2008). Marketing Japan's travel and tourism industry to international tourists, International Journal of Contemporary Hospitality Management, 21, 356–365. doi : http://dx.doi.org/10.1108/09596110910948341.

Ottenbacher, M., Harrington, R., & Parsa, H. G. (2009). Defining the Hospitality Discipline: A Discussion of Pedagogical and Research Implications. Journal of Hospitality & Tourism Research, 33, 263-283. doi: 10.1177/1096348009338675.

Ministry of Economic Development. (2011). Tourism Development Strategy 2011–2016. Retrieved from http://www.sltda.lk/sites/default/files/English.pdf.

World Tourism Organization. (2013). Tourism Highlights 2013. Retrieved from http://www2.unwto.org/publication/unwto-annual-report-2013.

World Tourism Organization. (2012).Global Report on Food Tourism 2012. Retrieved from http://dtxtq4w60xqpw.cloudfront.net/.../global_report_on_food_tourism.pdf

Sri Lanka Tourism Development Authority. (2012). Annual Statistical Report 2012. Retrieved from http://www.treasury.gov.lk/reports/annualreport/2012/1-EconomicPerspectives-Sri%20Lanka%20.pdf.

Ladhari, R. (2009). A Study in the Hotel Industry Service Quality, Emotional Satisfaction, and Behavioural Intentions. Managing Service Quality, 19, 308-331. doi: http://dx.doi.org/10.1108/09604520910955320.

Arora, R. (2012). A mixed method approach to understanding the role of emotions and sensual delight in dining experience, Journal of Consumer Marketing, 29, 333–343. doi: http://dx.doi.org/10.1108/07363761211247451

Neal, J. D., & Gursoy, D .(2008) . A Multifaceted Analysis of Tourism Satisfaction**,** Journal of Travel Research, 47,. 53-62 . doi: 10.1177/0047287507312434.

Chang, J.C. (2008). Attribution Tourists' Satisfaction Judgments: An Investigation of Emotion, Equity, and Attribution. Journal of Hospitality & Tourism Research, 3, 108-118.

Li, M., & Cai, L. A. (2012). The Effects of Personal Values on Travel Motivation and Behavioral Intention. Journal of Travel Research, 51, 473-487. doi:10.1177/0047287511418366.

Soloman, M. R. (2007). Consumer Behaviour: Buying, Having and Being. 7th ed. Person Prentice Hall.

Roday, S., Biwal, A., & Joshi, V. (2011). Tourism Operations and Management. Noida: Sri Krishna Printers.

Barutçu,S ., Doan, H., & Üngüren, E. (2011).Tourists' Perception and Satisfaction of Shopping in Alanya Region: A Comparative Analysis of Different Nationalities. 24,1049–1059.

Alegre, J. & Cladera, M. (2009). Analysing the Effect of Satisfaction and Previous Visits on Tourist Intentions to Return. European Journal of Marketing. 43, 670-685. doi: http://dx.doi.org/10.1108/03090560910946990.

Kamata, H. Misui, Y. & Yamauchi, H., 2010. How to attract more tourists?. Tourism Review, 65, 493-517. doi: http://dx.doi.org/10.1108/16605371011061606.

EVOLUTION OF THE METHODOLOGY OF TECHNICAL AND ALLOCATIVE EFFICIENCY STUDIES IN ECONOMICS: A REVIEW OF LITERATURE[1]

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ABSTRACT

Efficiency measurements have been a great concern of researchers with an aim to study the efficiency levels of almost all economic activities. Empirical estimation and identifying the determinants of efficiency are the major tasks in efficiency analysis. The main objective of this study is to investigate major changes taken place in the methodology of technical and allocative efficiency in economics. The historical approach is used as the methodology of this study. There was no accepted statistical methodology to measure economic, technical and allocative efficiencies until the study of Farrell (1957); "The Measurement of Productive efficiency". In economics, economic efficiency has two components which are referred to as technical efficiency and allocative efficiency. Technical efficiency is associated with the ability to produce on the frontier isoquant, while allocative efficiency refers to the ability to produce at a given level of output using the cost-minimizing input ratios. Few alternative parametric methods are available in literature such as production, cost, profit, revenue and distance functions to analyze efficiency by estimating production technology. The nonparametric methodology involves mainly the use of linear programming techniques. According to available literature, it is clear that various approaches to efficiency analysis have been developed by two parallel traditions, the econometric method and the non-parametric data envelopment analysis. Each of these traditions incorporate its inherent merits and demerits. Findings of the study reveal that input distance function is the best methodology for measuring allocative efficiency if inputs quantities do not significantly vary across units of studies.

Keywords: Technical Efficiency, Allocative Efficiency, Economic Efficiency

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1. Introduction

Productive efficiency has two components namely technical efficiency and allocative efficiency. The technical efficiency component refers to ability to minimize wastages by producing as much output by given level of inputs or by using as little input to produce given level of output. Thus, the technical efficiency can be explained based on two alternative arguments; an output augmenting and an input orientation. The allocative (price component) is defined as the ability to combine resources and outputs in optimal proportions. Many researchers have paid their attention to define the concept of efficiency and its components. Debreu (1951) and Farrel (1957) introduced a measure of technical efficiency. Based on Farrel (1957), measure of technical efficiency can be obtained by using input and output quantity without introducing prices of these inputs and outputs. Technical efficiency can be decomposed into three components such as scale efficiency, congestion and pure technical efficiency.

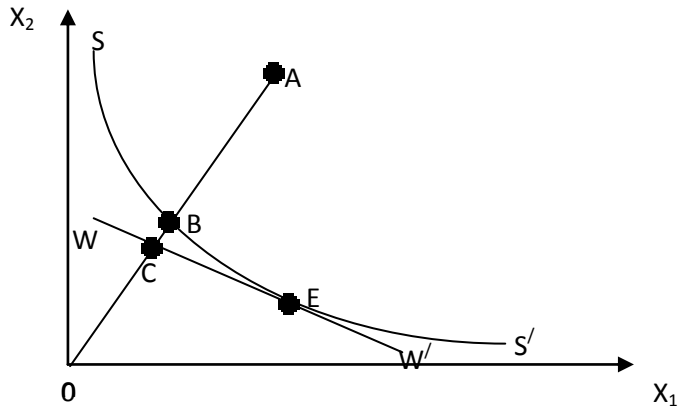
Technical efficiency is just one component of overall economic efficiency. However, a firm must first be technically efficient in order to be economically efficient. A firm should produce maximum output given the level of inputs employed in order to be technically efficient and should use the right mix of inputs in light of the relative price of each input in order to be allocativelly efficient (Kumbhaker and Lovell 2000). However, there are many examples in literature which show the difference between allocative efficiency and technical efficiency by using Isoquant curve.

In Figure 01 below, observation A utilizes two input factors to produce a single output. SS/ is the efficient isoquant curve estimated with an available technique. Point B on the isoquant represents the efficient reference of the observation A. The technical efficiency of a production unit operating at A is most commonly measured by the ratio TE = OB/OA, which is equal to one minus BA/OB. It will take a value between zero and one, and hence an indicator of the degree of technical inefficiency of the production unit. A value of one indicates that the firm is fully technically efficient, for instance, the point B is technically efficient because it lies on the efficient isoquant.

Allocative efficiency can be calculated if the input price ratio represented by the slop of the isocost line, $WW^{/}$ in Figure 01, is known, the allocative efficiency (AE) of a production unit operating at A is defined to be the ratio of AE = OC/OB.

Since the distance CB represents the reduction in production costs that would occur if production were to occur at the allocatively and technically efficient point E, instead of the technically efficient, but allocatively inefficient point B. The total economic efficiency (EE) is defined to be the ratio of EE = OC/OA where the distance CA can also be interpreted in terms of a cost reduction. Note that the product of technical efficiency and allocative efficiency measures provides the measure of overall economic efficiency.

FIGURE 01
Allocative and Technical Efficiency



Source: By the author based on literature survey

The research problem of the study is based on the following facts. Improving of economic efficiency is the key determinant in determining productivity of economic resources. In economic theory, achievement of both technical and allocative efficiencies is required in order to be economically efficient. There are different approaches and methods in the theory of economics in measuring technical and allocative efficiency, but there is no consistency among economists. There is a considerable number of studies in developing countries in which methods were selected without proper evidence. Within this context, the research problem of this study can be stated in the following manner; *How should we select a better methodology to estimate technical and allocative efficiencies with proper understanding of their merits and demerits?*

Thus, the main objective of the study is to investigate major changes taken place in the methodology of technical and allocative efficiency in economics. This study also aims at achieving the following objectives;

1. To identify differences among alternative approaches and methods in estimating technical and allocative efficiency.
2. To identify merits and demerits of alternative approaches and methods in estimating technical and allocative efficiency.
3. To identify a better methodology in estimating technical and allocative efficiency within the Sri Lankan context with special emphasis on agriculture sector.

The study aims to investigate major changes taken place in the methodology of technical and allocative efficiency in economics through analyzing available literature in this field. Historical approach is used as the methodology of this study to fulfill the aforementioned objectives. Most of the popular data bases

have been referred for the survey of literature and the sections of the analytical part are divided considering common features of the studies conducted in this field.

2. Analysis and Discussion

2.1. Measurements of Technical Efficiency

Various approaches to efficiency analysis have been used by two parallel traditions, the econometric methods (Aigner, et al., 1977, Battese, 1992) and the non-parametric Data Envelopment Analysis (DEA) methods (Silkman, 1986, Sengupta, 1989).

Basically DEA method is based on linear programming techniques and consists of estimating a production frontier through a convex envelop curve formed by line segments joining observed efficient production unit. DEA method can be known as Programming approach. Especially it should be noted that in this method there is no functional form imposed on the production frontier and there are no any assumptions made on the error term. However, both strengths and weaknesses can be seen in the Data Envelopment Theory in estimating technical efficiency.

TABLE 01
Strengths and Weaknesses of DEA Method

Strengths	Weaknesses
-DEA can be used for multiple inputs and multiple outputs.	-Measurement error is not considered.
-DEA doesn't require relating inputs to outputs.	-DEA does not measure "absolute" efficiency.
-Comparisons are subjective.	-Statistical tests are not applicable.
-Inputs and outputs can have very different units.	-Computation of large data set is difficult.

Source: Literature survey by the author

With recent developments in efficiency analysis, methods have been designed to overcome some limitations of DEA. A deterministic frontiers statistical theory is one of such methods in efficiency analysis. Simar (2003) has proposed a method to improve the performance of FDH/DEA estimators in the presence of noise, while Cazals et at. (2002) developed a robust none parametric estimator. Argon (2003) developed a new none parametric estimator of the efficiency frontier based on the conditional quintiles of an appropriate distribution associated with production process. However, this method has not extended to cover the multivariate analysis.

The second approach is the parametric approach. It is based on econometric estimation of a production frontier whose functional form is specified in advance. In

this approach, the Stochastic Frontier method is the most popular and also it is referred to as "composed error model", the Stochastic Frontiers method has the advantage of taking into account the random error and the inefficiency component specific to every plantation.

The Stochastic Frontiers production method was proposed for the first time by Aigner (1977) and Meeusen, and Broeck (1977). By following different parameterizations such as those of Battese and Corra (1977), Battese et.al (1998), and Battese (1992), the likelihood function of the model defined by the equation:

$$y_i = f(x_i, \beta) + v_i - u_i = f(x_i, \beta) + \varepsilon_i$$

where, v_i is the two-sided "noise" component, and u_i is the nonnegative technical inefficiency component of the error term. The noise component v_i is assumed to be independently and identically distributed and symmetric, distributed independently of u_i. Thus the error term $\varepsilon_i = v_i - u_i$ is not symmetric, since $u_i \geq 0$. Assuming that v_i and u_i are distributed independently of x_i.

The two approaches, econometric and DEA use different techniques to envelope data more or less tightly in different ways. In so doing they make different adaptation for random noise and flexibility in the structure of production technology. It is these two different adaptations that generate strengths and weaknesses of the two approaches.

1. The econometric approach is stochastic, and thus attempts to distinguish the effects of noise from the effects inefficiency. The programming approach is non-stochastic, and lumps noise and inefficiency together and calls the combination inefficiency.

2. The econometric approach is parametric, and confounds the effects of misspecification of functional form with inefficiency. The programming approach is nonparametric and less prone to this type of specification error.

Even though the methodology of Stochastic Frontier is highly used in technical efficiency analysis, it also comprises both strengths and weaknesses.

TABLE 02
Strengths and Weaknesses of Stochastic Frontier Method

Strengths	Weaknesses
-Ability of using stochastic error term for advance analysis	-In many studies the choice of the functional form appears to be arbitrary
-Ability of conducting statistical tests	-Most researchers do not invest much time and effort in choosing a particular distributional form
-Frontier methodology can be used to measure absolute efficiency	-The Stochastic Production Frontier approach is suited only for single-output technologies
-Analyzing of a large set of data is very easy	-Sample size should be a large one for more accuracy of results.

Source: Literature survey by the author.

2.2. Methods for Identifying Technical Efficiency Determinants

This section is specially focused to discover the methods related with Stochastic Frontier Production Function. According to literature, generally, two approaches used in analyzing the determinants of technical efficiency from a stochastic frontier production function can be identified. The first is called the two-step approach; first the Stochastic Frontier Production function is estimated to determine technical efficiency indicators. Next, indicators thus obtained are regressed on explanatory variables that usually represent the firm's specific characteristic, using the ordinary least square (OLS) method. This two-step approach has been used by authors such as Pitt and Lee (1981), Kalirajan (1981), Parikh and shah (1995), and Belhassen (2000) in their relevant studies.

The major drawback with the two-step approach resides in the fact that, in the first step, inefficiency effects (uj) are assumed to be independently distributed. In the second step, however, the technical efficiency indicators thus obtained are assumed to depend on certain number of factors specific to the firm, which implies that the (uj) are not identically distributed unless all the coefficients of the factors considered happen to be simultaneously null.

Kumbhakar (1991) and Reifschneider and Stevenson (1991) developed a model in which inefficiency effects are defined as an explicit function of certain factors specific to the firm, and all parameters are estimated in one step using the maximum likelihood procedure. By following this second approach Huang and Liu (1994) developed a non natural Stochastic Frontier Production function, in which the technical inefficiency effects are a function of a number of factors specific to the firm and of interactions among these factors and input variables introduced in the frontier function. Battese and Coelli (1995) also proposed a Stochastic Frontier Production function for panel data in which technical inefficiency effects were

specified in terms of explanatory variables, including a time trend to take into account changes in efficiency over time. The one step approach has since been used by such authors as Ajibefun (1996), Coelli and Battese (1996), Audibert (1971), Battese and Sarfaz (1998), and Lyubov and Jensen (1998) in their respective studies to analyze the factors affecting the technical efficiency/inefficiency of agricultural producers. According to available criticism, one-step approach is less criticized by researchers especially at the statistical level.

2.3. Measurements of Allocative Efficiency

Allocative efficiency is the second component of overall economic efficiency. Allocative efficiency is not highly addressed by researchers when compared with technical efficiency. According to the available literature, it is clear that, there are three alternative approaches in allocative efficiency analysis.

I. Computation of an allocative efficiency index through marginal value product and marginal factor cost (price) of resources

II. Computation of allocative efficiency through estimation of the cost function or implicit cost function

III. Computation of allocative efficiency through estimation of the input distance function

Allocative efficiency index is the ratio between marginal value product and marginal factor cost of a resource. This is the simplest method of analyzing allocative efficiency of factor inputs. There are two main drawbacks of this methodology. The first drawback is that, this method can be applied to analyze only individual allocative efficiency of factors and there is no way of measuring overall allocative efficiency. The second drawback is that the interrelationship among the factors of production is not considered by this method in estimating allocative efficiency. Oniah, Kuye and Idiong (2008), Suresh and Keshava Reddy (2006), Ogundari (2008) are some of the researchers who have applied this methodology for allocative efficiency analysis.

The issues of allocative and cost efficiency measurements through cost functions were addressed by Schmidt and Lovell (1979), who has described how one could estimate a Cobb-Douglas Stochastic Cost Frontier and then use duality to derive the implicit production frontier. With these two frontiers, one could then measure cost efficiency and technical efficiency, and calculate allocative efficiency residually. Schmidt and Lovell (1979) introduced the Cost Frontier method and it was extended to the very flexible translog functional form by various authors, such as Greene (1980) and Schmidt (1984). These new methods avoided the restrictions intrinsic in the Cobb-Douglas functional form, but at the cost of introducing considerable complexity to the modeling exercise.

Direct estimation of the Cost Frontier may not be much appropriate and practical in some cases, for instance, in a situation such as;

1. When there is no difference in input prices among firms
2. When there is a systematic deviation from cost minimization behavior in the industry; for example when political, union or regulatory factors cause shadow prices to deviate from market prices in a systematic way. In this situation, the duality between the cost and production functions break down, and the resulting bias in the cost frontier estimates will make the cost efficiency calculation and decomposition biased as well (T. Coelli, S. Singh, E. Fleming, 2003)

Basically there are two solutions; Implicit Cost Frontier and Input Distance Function could be identified in literature for the aforementioned issues. Implicit Cost Frontier is the direct estimation of the primal production technology, and then derivation of the implicit cost frontier; for example, Bravo-Ureta and Rieger (1991) estimated a Cobb-Douglas stochastic production frontier, and then derived the implicit cost frontier. This also has been criticized by many researchers. One particular contradiction in the Bravo- Ureta and Rieger (1991) approach is that a production function is estimated assuming that the input quantities are decision variables. Another weakness of the Bravo-Ureta and Rieger (1991) approach is that the use of the Cobb-Douglas functional form, which is a restrictive functional form. That is, it imposes unitary elasticities of substitution and constant production elasticities across all firms. In the empirical exercise in this paper we find that the more flexible translog functional form is not a statistically significant improvement over the Cobb-Douglas functional form. Although these weaknesses are reflected by the method introduced by Bravo- Ureta and Rieger (1991), it is being widely used in efficiency analysis.

Input Distance Function is another solution introduced by T. Coelli, S. Singh, E. Fleming in 2003. The specialty of the Input Distance Function can be summarized in the following aspects.

1. Prices of inputs that vary across the firms are not needed for this approach.
2. This is a strong solution for systematic deviations from cost minimization behavior.
3. It does not suffer from simultaneous equations bias when firms are cost minimizing firms or shadow cost minimizing firms.
4. The Input Function Approach can be used even for multiple products.

3. Conclusions

Various approaches to technical efficiency analysis have been used by two parallel traditions, the non-parametric Data Envelopment Analysis (DEA) and econometric methods. DEA method can be used for the researches associated with multiple inputs and multiple outputs but it is not a suitable method if the focus is an advanced statistical analysis, because this does not allow statistical significant tests of parameters. The second approach is the parametric approach. It is based on econometric estimation of a production frontier whose functional form is specified

in advance. In this approach, the Stochastic Frontiers method is the most popular. It is also referred to as "composed error model"; the Stochastic Frontier method has the advantage of taking into account the random error and the inefficiency component specific to every plantation. Ability of measuring absolute efficiency and ability of applying hypotheses are the main advantages of this approach. Still, there are few limitations of this methodology associated with multiple input and multiple output problems. Researchers have to be very careful in specifying a correct functional form for the frontier, since a wrong functional from generates totally inaccurate results.

Allocative efficiency is the second component of overall economic efficiency. According to the available literature, it is clear that there are three alternative approaches in allocative efficiency analysis; allocative efficiency index method, cost and implicit cost function method and input distance function method. If the prices of goods and inputs are varied across study units, first two methods can be applied and input distance function method is much applicable when prices of goods and inputs are not significantly varied across the study units.

There is no significant issue in selecting an approach in estimating the technical efficiency in Sri Lanka. DEA method can be applied for comparative efficiency analysis and this is especially powerful for multiple inputs and outputs problems. The econometric approach could be used if the functional form is very clear. This method is very suitable for advanced statistical analysis of economic efficiency.

The researcher has a great role in selecting a method for estimating allocative efficiency. For instance, paddy is the main agricultural product in Sri Lanka. There are two irrigation systems; major (Mahaweli systems) and minor in Sri Lankan paddy sector. Input distance function is the best method for estimating allocative efficiency in major irrigation systems, since input usages and price of output are not significantly varied across households. Cost function approach is better for estimating allocative efficiency in minor irrigation systems of paddy since inputs usages and prices are significantly varied across households.

References

Aigner, D.J., Lovell, C.A.K. and Schmidt, P., (1977). Formulation and Estimation of Stochastic Frontier Production Function Models, Journal of Econometrics, 6: pp. 21-37.

Ajibefun, I.A., Battese, G.E. and Daramola, A.G., (1996). Investigation of Factors Influencing the Technical Efficiencies of Smallholder Croppers in Nigeria, CEPA Working papers, No. 10/96, Department of Econometrics, University of England, Armidale, pp. 19.

Ali, M. and Chauudhry, M.A., (1990). Inter-regional farm efficiency in Pakitan's Panjab: a Frontier Production Function study, Journal of Agricultural Economics, 41: pp. 62-74.

Ali, M. and Flinn, J.C., (1989). Profit Efficiency among Basmati Rice Producers in Pakistan Punjab, American Journal of Agricultural Economics, 71: pp. 303-310.

Amaza, P.S. and Maurice, D.C., (2005). Identification of Factors that Influence Technical Efficiency in Rice-based Production Systems, Paper Presented at Workshop on Policies and Strategies for Promoting Rice Production and Food Security n Sub-Saharan Africa: 7-9 November 2005, Cotonou (Benin).

Amos, T.T., (2007). An analysis of Productivity and Technical Efficiency of Smallholder Cocoa Farmers in Nigeria, Journal of Social Sciences, 15: pp. 127-133.

Awudu, Abdulai and Eberlin, R., (2001). Technical Efficiency during Economic Reform in Nicaragua: Evidence from Farm Household Survey Data, Economics Systems, 25: pp. 113-125.

Battese, G.E. and Coelli, T.J., (1995). Model for Technical Inefficiency Effects in a Stochastic Frontier Production Function for Panel Data, Empirical Economics, 20: pp. 325-332.

Battese, G.E. and Corra, G.S., (1977). Estimation of a Production Frontier model: With Application to Pastoral Zone of Eastern Australia, Australian Journal of Agricultural Economics 21: pp.169-170.

Battese, G.E., (1992). Frontier Productions Functions and Technical Efficiency: A Survey of Empirical Application in Agricultural Economics, Agricultural Economics 7: pp. 185-208.

Battese, G.E., Coelli, T.J. and Colby, T.C., (1989). Estimation of Frontier Production Functions and the Efficiencies of Indian farmers using Panel data from ICRISAT's village level studies, Journal of Quantitative Economics, 5: pp. 327-348.

Battese, G.E., Coelli, T.J. and Colby, T.C., (1998). Prediction of Farm Level technical efficiencies with a Generalized Frontier Production Function and Panel Data, Journal of Econometrics, 38: pp. 387-399.

Bedassa, Tadesse, and Krishnamoorhy, S., (1997). Technical Efficiency in Paddy Farms of Tamil Nadu: An Analysis Based on Farm Size and Ecological Zone, Agricultural Economics, 16: pp. 185-192.

Belbase, K. and Grabowski, R., (1985). Technical Efficiency in Nepalese Agriculture, Journal of Development Areas, 19: pp. 515-25.

Ben-Belhassen, B., (2000). Measurement and Explanations of Technical Efficiency in Missouri Hog Production, Selected Paper, American Agricultural Economics Association, Annual Meeting, Tampa, Florida, 30 july-2August.

Bravo-Ureta, B.E. and Pinheiro, A.E., (1993). Efficiency Analysis of Developing Country Agriculture: A Review of the Frontier Function Literature, Agriculture and Resource Economic Review, 22: pp. 88-101.

Bravo-Ureta, B.E. and Pinheiro, A.E., (1993). Efficiency Analysis of Developing Country Agriculture: A Review of the Frontier Function Literature, Agriculture and Resource Economic Review, 22: pp. 88-101.

Cazals, C., Florens, J. P. and Simar, L. (2002), "Nonparametric Frontier Estimation: a Robust Approach", Journal of Econometrics, pp. 1–25

Charnes, A., Cooper, W.W. and Rhodes, E., (1978). Measuring the efficient of Decision Making Units, European Journal of Operational Research, 2: pp. 429-444.

Coelli, T.J. and Battese, G.E., (1996). Identification of Factors which Influence the Technical Efficiency of Indian Farmers, Australian Journal of Agricultural Economics, 40: pp. 103-128.

Coelli, T.J., (1995). Recent Development in Frontier Modeling and Efficiency Measurment, Australian Journal of Agricultural Economics, 3: pp. 219-245.

Coelli, T.J., Prasada Rao, D.S. and Battese, G.E., (1998). An Introduction to Efficiency Measurement and Productivity Analysis, Boston: Kluwer Academic Publishers.

Coelli, T.J., Rahman S. and Thirtle, C., (2002). Technical, Allocative, Cost and Scale Efficiencies in Bangladesh Rice Cultivation: A Non-Parametric Approach, Journal of Agricultural Economics, 53: pp. 607-626.

Debreu, G. (1951). The Coefficient of Resource Utilization, Econometrica, 19:3 pp. 273-292.

Farrel, M.J., (1957). The Measurement of Productive efficiency, Journal of the Royal Statistical Society, Series A, General, 120: pp. 253-281.

Gong, B.H. and Sickles, R.C., (1992). Finite Sample Evidence on the Performance of Stochastic Frontier and Data Envelopment Analysis Using Panel Data, Journal of Econometrics, 51: pp. 259-284.

Green, W.H., (1980a). Maximum Likelihood Estimation of Econometrics Frontier Functions, Journal of Econometrics, 13: pp. 27-56.

Green, W.H., (1980b). On the Estimation of a Flexible Frontier Production Model, Journal of Econometrics, 13: pp. 101-115.

Green, W.H., (1990). A Gamma-Distributed Stochastic Frontier Model, Journal of Econometrics, 46: pp. 141-164.

Gunaratne, L.H.P., Krishanth, M., Ekanayake, E.M.T. and Gunawardene, E.R.N., (2004). An Economic Evolution of Micro Irrigation Systems in Low Country Dry Zone, Water Professionals' Symposium.

Helfand, S.M., (2003). Farm Size and Determinants of Productive Efficiency in the Brazilian Centre-West, Paper Presented at the 25th International Conference of the International Association of Agricultural Economist (IAAE), Durban, South Africa, 16-22 August.

Hjalmarsson, L., Kumbhakar, S.C. and Heshmati, A., (1996). DEA, DFA, and SFA: A Comparison, Journal of Productivity Analysis, 7: pp. 303-327.

Huang, C.J. and Liu, J.T., (1994). Estimation of a non-neutral stochastic frontier production Function, Journal of Productivity Analysis, 5: pp. 171-180.

Jayaweera, B.P.A.J., (2006). Rice-Goldfish Integration: Performance of Goldfish (Carassius auratus) in an Irrigated Rice Field and Development of Suitable Culture Systems for Post Larvae and Fry, A Master Thesis Submitted to, Postgraduate Institute of Agriculture, University of Sri Lanka, January 2006.

Jondrow, J., Lovell, C.A.L., Materov, I.S. and Schmidt, P., (1982). On the Estimation of Technical Inefficiency in the Stochastic Frontier Production Function Model, Journal of Econometrics, 19: pp. 233-238.

Kalaitzandonakes, N.G., Shunxiang, W.U. and Jian-Chun, M., (1992). The Relationship between Technical Efficiency and Firm Size Revisited, Canadian Journal of Agricultural Economics, 40: pp. 427-442.

Kalirajan, K., (1981). An Econometric analysis of Yield Variability in Paddy Production, Canadian Journal of Agriculture Economics, 29: pp. 167-80.

Kebede, T.A., (2001). Farm Household Technical Efficiency: A Stochastic Frontier Analysis, A Master Thesis Submitted to, Department of Economics and Social Sciences, Agricultural University of Norway, June 2001.

Kibaara, B.W., (2005). Technical Efficiency in Kenyan's Maize Production: An Application of the Stochastic Frontier Approach, Master Thesis Submitted to the Colorado State University, Colorado.

Kong, X., Marks, R.E. and Wan, G.H., (1999). Technical Efficiency: Technological Change and Total Factor Productivity Growth in Chinese State-Owned Enterprises in the Early 1990s, Asian Economic Journal, Vol.13 No. 3.

Koopmans, T.C., (1951). An Analysis of Production as an Efficient Combination of Activities, in T.C. Koopmans, ed., Active Analysis of Production and Allocation, Cowles Commission for Research in Economics, Monograph No.13. New York: John Wiley and Sons, Inc.

Kumbhakar, S.C., (1991). Estimation of technical inefficiency in panel data models with firm- and time-specific effects. Econ Lett, 36: 43–48

Kumbhakar, S.C. and Lovell C.A.K., (2000). Stochastic Frontier Analysis, Oxford University Press, Oxford.

Lezin, A.H. and Long-Bao, W., (2005). Agricultural Productivity Growth and Technology Progress in Developing Country Agriculture: Case Study in China, Journal of Zhejiang University SCIENCE, pp. 172-176.

Lovell, C.A.K., (1993). Production Frontiers and Productive Efficiency, in H.O. Fried, C.A.K Lovell, S.S. Schmidt, ed. The measurement of Productive Efficiency, New York: Oxford University Press.

Lyubov, A.K. and Jensen, H.H., (1998). Technical Efficiency of Grain Production in Ukraine, Paper Presented at the American Agricultural Economics association Annual Meeting, Salt Lake City, Utah, 2-5 August.

Margono, H. and Sharma S.C., (2004). Technical Efficiency and Productivity Analysis in Indonesian Provincial Economize, Working Paper.

Meeusen, W. and J. van den Broeck, (1977). Efficiency estimation from Cobb-Douglas production functions with composed error," International Economic Review, 8: pp. 435–444.

Nchare, A., (2007). Analysis of Factors Affecting the Technical Efficiency of Arabica Coffee Producers in Cameroon, AERC Research Paper 163, African Economic Consortium, Nairobi, January 2007.

Nsuya, Elibariki and Gasper, A., (2005). Estimation of Technical Efficiency in Tanzanian Sugarcane Production: A Case Study of Mitibwa Sugar Estate Outgrowers Scheme, Mpra, No. 3747.

Oladeebo, J.O. and Fajuyigbe A.A., (2007). Technical Efficiency of Men and Women Upland Rice Farmers in Osun State, Nigeria, J. Hum. Ecol, 22: pp. 93-100.

Parikh, A.F. and Shah, M.K., (1995). Measurement of Economic Efficiency in Pakistani Agriculture, American Journal of Agricultural Economics, 77: pp. 657-685

Pitt, M.M. and Lee, L.F., (1981). The Measurement and Sources of Technical Inefficiency in the Indonesian Weaving Industry, Journal of Development Economics, 9: pp. 43-64, North-Nolland Publishing Company.

Reifschneider, D and Stevenson, R., (1991). Systematic departures from the frontier: A framework for the analysis of firm inefficiency, International economic review, 32: pp. 715-723

Schultz, T.W., (1964). Transformation Traditional Agriculture, New Haven: Yala University Press.

Sengupta, J.K. (1989). Efficiency Analysis by Production Frontiers: The Nonparametric

Seyoum, E.T., Battese, G.E. and Fleming, E.M., (1998). Technical Efficiency and Productivity of Maize Producers in Eastern Ethiopia: A Study of Farmers within and outside the Sasakawa Global 2000 Project, Agricultural Economics, 19: pp. 341-48.

Silkman, R.H., (ed) (1986). Measuring Efficiency: An Assessment of Data Envelopment Analysis, Jossey-Bass.

Simar, L. (2003). Detecting Outliers in Frontiers Models: a Simple Approach, Discussion paper 0146, Institut de Statistique, UCL, to appear in Journal of Productivity Analysis.

Sriboonchitta, S. and Wiboonpongse, A., (2001). On estimation of Stochastic Production-Frontiers with Self-Selectivity: Jasmine and Non-Jasmine Rice in Thailand, Research Project, Strategies for Technical Efficiency Improvement of Jasmine Rice under Biological Risk, Sep, 2001.

Tauer, L.W. and hanchar, J.J., (1995). None Parametric Technical Efficiency with K Firms N Inputs, and M Outputs: A simulation, Agricultural and Resource review 24: pp. 185-189.

IS POLITICAL ENVIRONMENT A BREEDING GROUND FOR PUBLIC SECTOR CORRUPTION? EVIDENCE FROM A CROSS-COUNTRY ANALYSIS

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Abstract

This study employs the instrumental variable two-stage least squares regression approach for the data for 121 countries to explore the impact of a country's political environment on its level of corruption. The study provides strong evidence that a higher degree of rule of law, press freedom, readiness and capacity to handle e-governance practices, and urbanization are associated with a lower level of public sector corruption across all 121 countries. The colonial dummies and having a presidential government are found to be valid instruments for rule of law in addressing the issue of endogeniety embedded in it. Further, to a certain degree, landlocked countries are relatively more corrupt than coastal countries. Finally, policy implications are discussed based on the findings of the study.

Keywords: Corruption, Political Environment, Endogeniety, Public Sector
JEL Codes: D72, D73, H11, K42

1. Introduction

In general, public sector corruption means misusing entrusted authority or public office for private benefits or personal gains. Yet, the meaning of corruption is contextual and has been articulated in different nation state vernaculars accordingly. For instance, in Italian, corruption is called *spintarella*, which means 'a little push', in Greek, *fakelaki*, 'a little envelope', in French, *pot-de-vin*, 'a glass of wine', and in Spanish, *mordida* 'a bite'. Likewise, in Slovak, corruption is called *pod stolom*, meaning 'under the table', in Korean, *noemul*, 'giving goods in secret', and in Japanese, *kuroi kiri*, 'black mist'. Hence, the term corruption carries different meanings in different contexts with differing ways of application, however, sharing the commonality that corruption is a secret act of dishonesty for private interest. Senior (2006) defines corruption as an action to secretly provide a good or a service to a third party, so that he or she can influence certain actions, which benefit the corrupt, a third party, or both in which the corrupt agent has authority.

Today, corruption is all too prevalent, not only in developing countries, but also in the EU (Senior, 2006). Corruption inflicts various adverse impacts on

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economic, social, and political systems of a country. Economists have clearly shown how economic growth of a country can be adversely affected by corruption: corruption increases transaction costs and reduces incentives for investment, thereby leading to shrink the growth rate of an economy. It also affects income growth, particularly of the poor, redistributing wealth away from the poor to the better-off and employees of government. This gives rise to increased income inequality in a country (see Gupta *et al.*, 1998; Fisman and Svensson, 2000; Senior, 2006). Moreover, corruption imposes a negative impact on tax revenue of a country. As Ghura (1998) argues, an increase in the level of public sector corruption accompanies a lowering of the tax-revenue-GDP ratio. Tanzi and Davoodi (2000) computed that one-point increase in the Corruption Perceptions Index (CPI) is associated with 2.7 percentage point decline in tax-GDP ratio. Transparency international (2010) points out that public sector corruption erodes the tax revenue base in the long-run, corrodes the tax morality of taxpayers, and distorts tax structures, leading to increase the size of unofficial economy of countries. Public sector corruption can, therefore, cause critical damage to the smooth functioning of an economy.

Further, as argued by Seligson (2002), corruption generates political costs. On the basis of 9,000 observations from four Latin American countries, Seligson (2002) contends that corruption erodes belief of participants in the political system and reduces interpersonal trust, questioning the legitimacy of the system. Apart from economic and political costs, corruption involves social and moral costs, meaning that social variables are negatively impacted by corruption. For instance, Dreher and Herzfeld (2005) computed negative impacts of corruption on social variables like life expectancy and school enrollment using data from 71 countries. In sum, as Senior (2006) points out, corruption can cause serious impediment to the development of a market economy and a free society.

It should be noted that the studies on public sector corruption have become prominent at present due to the fact that corruption is widespread in all over the world. The Transparency International (2013) considered 177 countries for ranking based on their level of corruption, but more than two-third of those countries scored less than fifty (50). Also the studies on corruption provide useful facts to address the question of how governments are made effective. As emphasized by Uslaner (2009), public sector corruption leads to reduced-salaries for their employees, because corrupt-governments spend less money on their workforce. Ultimately, this results in low level of economic growth and ineffective governments in countries. Moreover, as argued by Fritzen *et al.* (2014), the overall quality of public sectors depends on higher level of social trust resulted from lower levels of corruption. Therefore, to ensure higher quality of public sectors with higher levels of social trust, governments need to combat corruption. The initial step in combating corruption in any context would be to identify its underlying determinants. Accordingly, this study uncovers such determinants depending on the most recent

data published by relevant institutions including, the Transparency International and the World Bank.

Determinants of corruption are numerous and multifaceted, thus making any scientific study of it causes a difficult task. Yet, the rich literature available on the causes of corruption notes that economic, cultural, political, sociological, psychological, and geographical factors play a major role in determining the level of corruption, whereas Ata and Arvas (2011) considering the mean values of data for 25 European countries during 2004 through 2007 have concluded that higher GDP per capita, lower inflation rates, and lower income disparity reduce the perception of corruption. However, they've found that corruption levels are not affected by rates of economic growth. Several studies have pointed out that economic factors are more important than non-economic factors in reducing corruption. For instance, on the basis of 41 developing countries, Shabbir and Anwar (2007) emphasize that in order to curb corruption, governments need to focus on economic freedom, globalization, and distribution of income and wealth, while non-economic factors consisting of press-freedom, democracy, and people's religious beliefs do not play a role in corruption. Conversely, some other studies have noted that social factors including population growth rate, literacy rate, and religious beliefs do play a role in deciding the level of public sector corruption. For instance, Akano *et al.* (2013), using vector error-correction models for Nigeria, have shown the role of population growth rate and literacy rate in determining corruption, while Treisman (2000) has found that people's Protestant traditions are a significant determinant of curtailing corruption.

Regarding political factors of corruption, Ali and Isse (2003) contend that higher judicial efficiency and smaller governments are associated with lower levels of corruption in countries. However, Kotera *et al.* (2010) argue that the size of government does not matter in determining the level of corruption as long as the level of democracy remains sufficiently high. Therefore, as a part of democracy, rule of law has a bigger role to play in achieving lower levels of corruption (Salih, 2013). Using a non-linear model to show the democracy-corruption link, Sung (2004) has clearly proven the fact that democratic accomplishments reduce the degree of political corruption in a country. Also, some studies have used instrumental variable regressions to consistently show the link between fiscal decentralization and degree of corruption, arguing that fiscal decentralization in public expenditure and taxation leads to reduced corruption levels (for instance see Fisman and Gatti, 2002; Altunbas and Thornton, 2012). Conversely, Pellegrini and Gerlagh (2007) have found no evidence to support fiscal decentralization as a determinant of political corruption.

Finally, studies have tested technology-related variables to see if there is any link between corruption and technology. For instance, Pathak *et al.* (2009) presenting a Fijian case have emphasized that IT-based service delivery processes contribute to curbing public sector corruption. Also, Murillo (2013) using six-year

panel data for 208 countries has shown that using the Internet and government web portals reduces the negative perceptions towards public sector corruption.

Within this context, this study is primarily aimed at analyzing the role of political environment in determining the level of public sector corruption in 121 countries, both developed and developing. The 'traditional elements' of political environment, i.e., the elements that have been tested in previous studies, comprise rule of law, press freedom, nature of legislature, being a federal or unitary state, size of government, and openness of markets. In addition to testing these traditional elements, more importantly, this study will be examining the role of e-governance practices and military involvement in politics, two 'potential elements' of political environment that have not been tested before, in curbing corruption. Also, in this study, we have used several control variables, namely GDP per-capita, Gini index, and religious beliefs, three variables that have been previously used though, and the rate of urbanization and being a landlocked country, two potential control variables that have not been used in previous studies and thus unique to this study.

Corroborating the findings of previous research, our analyses show that ensuring rule of law and press freedom reduces public sector corruption significantly. Yet, more importantly, our study shows that e-governance practices can play a significant role in reducing public sector corruption, thus enriching the existing body of knowledge. Based on the estimates of control variables, it was found that countries with higher urbanization rates are less corrupt and vice versa. Further, to a certain degree this study proves that landlocked countries are more corrupt than coastal countries. Since this study is based on 121 countries consisting of both developed and developing countries, the findings are generalized to both contexts, the developed and developing. The rest of the paper is organized in the order that section two elaborates research methodology employed to realize the set objectives, while section three is devoted to elaborate the data and their summary statistics. The empirical results and main findings are discussed in section four, while section five concludes the study together with policy implications.

2. Research Methods

We consider the level of public sector corruption of a country as a function of its political environment. In this study, "public sector corruption" is defined as abusing of entrusted power by low-and middle-level public officials when they interact with the citizenry. Also the term "public sector" covers the central governments of countries and their decentralized-units that utilize public funds to provide services with the objective of enhancing social welfare. Also, the act of abusing of entrusted power includes a variety of misconducts ranging from grand corruption to the misconducts in procurement procedures in public sector organizations. As noted above, a wide range of variables are taken into account to capture the impact of political environment on corruption including rule of law, nature of legislature, being a federal or unitary state, press freedom, size of government, openness of markets, readiness for e-governance practices, and

military in politics. The impact of the factors external to the political environment is controlled by including an array of variables in estimating the model. They include a country's main religion, being a landlocked country, urbanization, per capita GDP, and income distribution among people.

Addressing Endogeniety

Endogeniety might be an issue when using rule of law as an explanatory variable in the corruption equation due to reverse causation and measurement errors. Public sector corruption can become a serious issue threatening the rule of law of a country. According to the Committee on Legal Affairs and Human Rights of the Council of Europe (2013), any form of corruption including ministers abusing their power, police officials taking bribes, elections being 'bought', crooked judges, money laundering, parliamentarians claiming false expenses, and illegal lobbying weaken public institutions, undermining the rule law of the member states of the Council. Fedotov (2012) points out that rule of law cannot be established and ensured where bribery and corruption are prevalent due to the fact that public sector corruption shuns fair tendering and recruitment processes.

Further, there are several pitfalls in measuring complex social phenomena, such as rule of law. Ginsburg (2011) notes that quantifying rule of law is challenging, resulting from the associated issues of conceptualization and measurement. Regarding the concepts of social sciences, it is relatively more difficult to formulate a concept by allowing a certain degree of abstraction. Put differently, in formulating social science concepts, the formulator should be clear enough as to what is being measured. Finally, poor conceptualization leads to bad quantification with measurement errors. This study uses World Bank's World Governance Indicators' Rule of Law Index, which is, however, subject to the same weakness discussed above. Ginsburg (2011) contends that this index aggregates too many discrete elements into a single concept. In computing the rule of law index, the World Bank has included the procedural elements as well as the substantive concepts, whereas procedural elements are related to the process of contract enforcement, the police and the courts, while substantive concepts are security of individuals and freedom from crime. These two categories of elements may not be combined together to formulate a single index.

Therefore, in this study, the issue of endogeniety has been addressed using instrumental variables (IVs), and we use instrumental variable two-stage least squares (IV-2SLS) approach to estimate the coefficients. As instrumental variables, we use three dummy variables that indicate whether a country was a British colony or a Spanish colony and currently a presidential democracy. There is likelihood that these three variables are indirectly related to the level of public sector corruption through rule of law. Thus, the main regression model that we are interested in is as follows:

$$Corruption\_Level_i = \beta_0 + \beta_1(Political\_environment_i) + \beta_2(Other\_Controls_i) + \varepsilon_i \quad (1)$$

However, rule of law that is included in the vector of political environment is estimated by employing the dummy variables for former British colony, Spanish colony, and current presidential government as instruments to address the issue of endogeniety. As literature contends, colonial history affects the level of rule of law in a country (for instance see La Porta *et al.*, 1998; Licht *et al.*, 2003; and Croix and Delevallade, 2011). Cameron *et al.* (2006) argue that the problems of presidential governments are associated with rule of law. They clearly prove that the rule of law is weak in most presidential democracies when compared with parliamentary governments. Therefore, the predicted values of the variable "rule of law" ($\hat{Rule\_of\_law}$) is calculated depending on the following equation:

$$Rule\_of\_Law_i = \pi_0 + \pi_1 British\_Colony_i + \pi_2 Spanish\_Colony_i + ... \\ ...\pi_3 Presidential\_Govt._i + \pi_4 Other\_exogenous\_variables_i + \mu_i \quad (2)$$

The predicted values of the variable "Rule of Law" is included in the equation (1) as a component of political environment. Also, ε_i and μ_i are structural error terms of the equation (1) and (2), respectively.

The results of the test for over-identifying restrictions and the Durbin-Wu-Hausman test for endogeniety are reported in the last four rows of Table 03. The Wooldridge's score tests of over-identifying restrictions are not statistically significant even at 10 per cent error level across three models estimated using different corruption indices as the dependent variable. Thus, we fail to reject the null hypothesis that our instruments are valid. It further says the instrumental variables: two colonial dummies and presidential government dummy are correlated with the rule of law and uncorrelated with the structural error term. Having ensured that the instrumental variables are satisfactory, the Durbin-Wu-Hausman test is conducted to check the endogeniety of the variable, rule of law. The null hypothesis that the regressors are exogenous is rejected at one per cent error level for the second model, where the dependent variable is World Governance

Indicators-Corruption Index (WGI) and 10 per cent error level for the first and the third models, where the dependent variables are Corruption Perception Index (CPI) and International Country Risk Guide-Corruption Index (ICRG), respectively. Therefore, it is clear that the rule of law is an endogenous regressor and that we need to employ instrumental variable approach instead of OLS approach.

Robustness Check

In order to secure robustness of the findings, OLS and IV-2SLS models are estimated by using three different measurements of public sector corruption, namely CPI, WGI, and ICRG. The source and the range of each index are presented in Table 01.

TABLE 01
Alternative Indices for the Level of Public Sector Corruption

Corruption Index	Compiler	Range	
		Very Clean →	Highly Corrupt
Corruption Perception Index (CPI)	Transparency International, Berlin	10	0
International Country Risk Guide (ICRG)-Corruption Index	The Political Risk Services (PRS) Group, New York	6	0
The Worldwide Governance Indicators (WGI)-Corruption Control	The World Bank, Washington D.C.	2.5	-2.5

Source: Transparency International, 2012, The PRS Group, 2012, The World Bank, 2012.

These three corruption indices have been compiled by the Transparency International, the World Bank, and the Political Risk Services (PRS) group, respectively. Though their ranges are different, in all three indices, higher index values indicate lower levels of corruption and vice versa. This is a commonly accepted method of checking the robustness of the findings of corruption-related research (for instance see Fisman and Gatti, 2002; Pellegrini and Gerlagh, 2007; Kotera *et al.*, 2010).

3. Data and Summary Statistics

Public Sector Corruption

The data used are based on 2012 and as mentioned above, the number of countries is 121 (n=121). The study uses three indices to account for public sector corruption and the summary statistics of variables are provided in Table 02.

Accordingly, based on CPI and ICRG, North Korea has been identified as the most corrupt, whereas based on WGI and ICRG, Libya has been ranked as the most corrupt in the world. On the other hand, according to all three indices, Denmark has been identified as the cleanest in the world. Finland, New Zealand, Norway, and Sweden are also among the cleanest countries. Figure 01 positions all 121 countries on a CPI-ICRG plane.

Figure 01 shows that as the cleanest countries, Denmark, New Zealand, Finland, Sweden, and Norway are well above the mean index values, while North Korea, Libya, Zimbabwe, Haiti, and Venezuela as the most corrupt countries are far below the mean index values. Though Figure 01 generally depicts a positive correlation between CPI and ICRG, countries are rather sparsely scattered on the graph, showing a variation in the perception of corruption reflected by the two indices. For instance, Indonesia and Bangladesh are located above ICRG-average, but below CPI-average. Likewise, Lithuania, Costa-Rica, Turkey, and Czech Republic are located above mean-CPI scores, but below mean-ICRG scores.

Political Environment

The data capturing the nature of each country's legislature include *first*, whether the legislature is unicameral or bicameral and *second*, women's participation in legislature. The data on whether it is a unicameral or bicameral state is recorded as a dummy variable by obtaining information from the World Fact Book by the Central Intelligence Agency (CIA) of the United States. Unicameral is a type of legislature with single house in the legislative council, while bicameral legislative council consists of two houses: lower house and upper house. As Table 02 illustrates, approximately 55.4 percent of the countries have unicameral legislatures. The data on women's participation in legislature were from Inter-Parliamentary Union (IPU), which is the international organization of parliaments. The IPU reports percentage figures of female members in legislature for each country. If the legislature is bicameral, women's participation in both lower and upper houses is reported separately. However, this study uses women's participation in legislature in each country as a whole. On average, in the selected 121 countries, 19 percent of the members in the legislature are women, however, the percentage figures varying vastly across countries. In the legislative councils of Qatar and Saudi Arabia, there is no women's representation, while Sweden records the highest women's representation in legislature. Moreover, the data on whether a country is federal or unitary were also obtained from the CIA World Fact Book. Accordingly, of the sample, approximately 15 per cent of the countries are federal states.

TABLE 02
Summary Statistics

	N	Mean	SD	Minimum		Maximum	
Corruption Indices							
CPI	121	46.347	19.852	8.000	[N. Korea]	90.000	[Denmark, Finland, New Zealand]
WGI	121	0.067	1.051	-1.400	[Libya]	2.390	[Denmark]
ICRG	121	2.665	1.224	1.000	[Haiti, N. Korea, Libya, Venezuela, Zimbabwe]	5.500	[Denmark, Finland, New Zealand, Norway, Sweden]
Political Environment							
Rule of law	121	0.085	1.000	-1.690	[Venezuela]	1.950	[Norway]
Unicameral legislature	121	0.554	0.499	0		1	
Press freedom index (inv)	121	0.047	0.032	0.012	[N. Korea]	0.157	[Finland]
E-government index	121	0.546	0.208	0.000	[Guinea, Libya]	0.913	[Netherlands]
Limited government	121	67.943	17.168	2.500	[N. Korea]	92.700	[Paraguay]
Open markets	121	62.529	16.025	0.000	[N. Korea]	90.000	[Hong Kong]

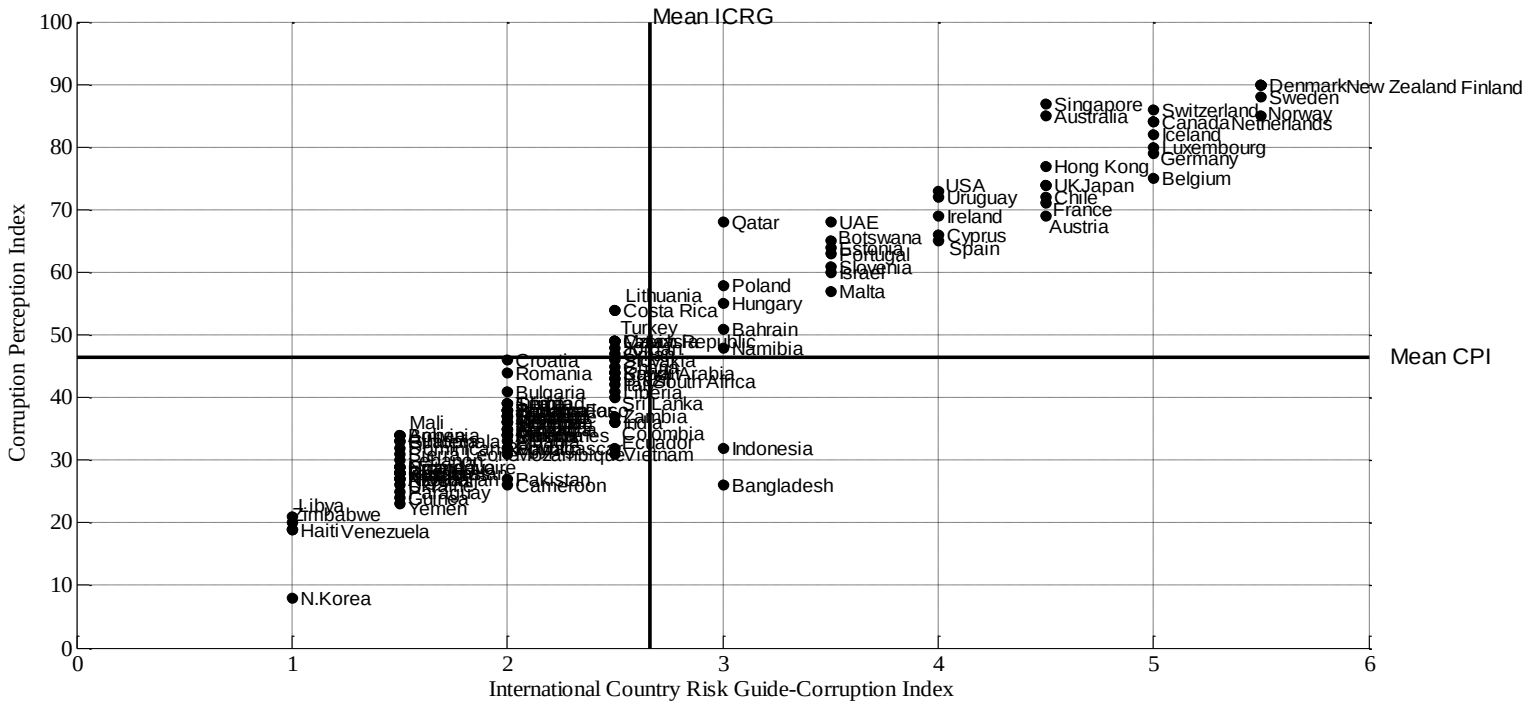
(Table 02 continued)

(Table 02 continued)

Federal state	121	0.149	0.357	0		1	
Women in legislature	121	18.973	10.611	0.000	[Qatar, Saudi Arabia]	44.699	[Sweden]
Military in politics	121	4.050	1.563	0.000	[Haiti]	6.000	[OECD members, Costa-Rica, Namibia, Jamaica, Malta]
Baseline Controls							
Urbanization rate	121	1.820	1.363	-0.500	[Lithuania]	6.200	[Burkina Faso]
Landlocked dummy	121	0.165	0.373	0		1	
Gini index (inv)	121	0.027	0.006	0.016	[South Africa]	0.043	[Sweden]
Log (Per capita income)	121	9.222	1.222	6.215	[Zimbabwe]	11.541	[Qatar]
Major religion (Islam)	121	0.248	0.434	0		1	
Major religion (Christianity)	121	0.488	0.502	0		1	
Instrumental Variables for the Rule of Law							
Former British colony	121	0.273	0.447	0		1	
Former Spanish colony	121	0.149	0.358	0		1	
Presidential government	121	0.471	0.501	0		1	

Source: Own calculations

FIGURE 01
The Level of Public Sector Corruption in the Selected Countries Based on CPI and ICRG, 2012



Source: Own calculations based on Transparency International, 2012 and the PRS Group, 2012.

The data on press freedom were obtained from the World Press Freedom Index annually published by Reporters without Borders, a consultancy non-profit organization of the UN and UNESCO. The World Press Freedom Index captures the level of freedom enjoyed by both media personnel and media organizations in each country. It also measures the extent to which the authorities work towards assuring freedom of information. The index ranges from 0 to 100 with 0 being the best possible score, while 100 being the worst possible. In order to make the direction of all study variables consistent and easier to interpret, we used inverse of the world press freedom index. Therefore, in this study higher values reflect relatively greater levels of press freedom and vice versa. As depicted in Table 02, North Korea and Finland were the extremes with North Korea enjoying the least press freedom, while Finland the highest press freedom.

The E-Government Development Index is a composite indicator which measures the extent to which authorities are ready and capable enough in employing information and communication technology (ICT) in delivering public services. The data were obtained from the E-Government Development Survey, 2012 conducted by the UN. The index ranges from zero to one, where zero indicates the least readiness and capability towards e-government applications while one indicates the highest readiness and capability. On average, the countries recorded 0.55 on e-government index, however, the index value varying across countries with a standard deviation of approximately 0.2. Guinea and Libya recorded the lowest readiness and capability in e-government practices while Netherlands the highest readiness and capability.

The data on limited government and open markets are from 2012-Index of Economic Freedom published by the Heritage Foundation and the Wall Street Journal. These indices vary from zero to 100 with higher values signaling relatively stronger performance and vice versa.

The data on limited government captures the extent to which individuals and businesses are free from government control in using their income and wealth for own ends, and the cost of excessive government in terms of public expenditure. Hence, the Limited Government Index is the arithmetic mean of the indices, Fiscal Freedom Index and Government Spending Index. In terms of limited government index, North Korea reported the lowest performance, while Paraguay the highest. The Open Market Index is calculated by taking the simple mean of the indices, Trade Freedom, Investment Freedom, and Financial Freedom Index. Trade freedom is an economy's level of openness to international trade while investment freedom is the level of freedom to capitalize entrepreneurial opportunities. Financial freedom is the level of openness, transparency, accessibility, and fairness of a country's financial system. In terms of open market index, North Korea and Hong Kong reported the lowest and highest scores, respectively.

The data on rule of law were obtained from the World Bank. These data capture the level of confidence of agents in the rules of society, quality of contract enforcement, property rights, the police, and the courts. This index varies from -2.5

to +2.5 with higher positive values indicating higher levels of government performance with regard to rule of law and vice versa. On the index, the countries scored 0.085 on average, however, with significant variations across countries with a standard deviation of one. However, Venezuela and Norway were the weakest and strongest in ensuring rule of law, respectively.

Furthermore, International Country Risk Guide (ICRG) by the Political Risk Service (PRS) provides data on military in politics as an index ranging from zero to six, where higher values reflect lower levels of political militarization of countries and vice versa. The average index value was 4.05. However, Haiti was recorded to be having the highest military intervention in politics while the OECD countries accounted for in the study sample together with Costa-Rica, Namibia, Jamaica, and Malta were recorded to be enjoying the least military intervention in politics.

Baseline Controls and Instruments

As highlighted above, this study uses a wide range of control variables, including urbanization rate, being a landlocked country, Gini index, per capita income, and the major religion of the selected countries. It should be noted that data for all these variables are from CIA World Factbook. The urbanization rate measures the percentage change in a country's urban population over a period of one year. On average, urban population is on the increase at a rate of 1.8 per cent. Burkina-Faso reported the highest urbanization rate in 2012. On the contrary, Lithuania recorded a decrease in the size of urban population being the country with the lowest rate of urbanization. Regarding income distribution, we use the inverse of Gini coefficient to account for the distribution of income among people. In 2012, South Africa and Sweden reported the highest and lowest income disparity, respectively. In terms of per capita income, Zimbabwe and Qatar reported the worst and best performance, respectively.

In terms of instrumental variables, of the sample 27.3 per cent are former British colonies, 14.9 per cent are former Spanish colonies, while 47.1 per cent have presidential governments. Table 02 presents summary statistics for these instrumental variables.

In case of using secondary data, it is important to consider two conditions when it comes to reliability and validity. First, any researcher needs to ensure that data cover population that the study needs to study. Since the study considers data from 121 countries, the findings would be reasonably representative of the population. Second, researchers need to have clear explanation of the process of collecting data. As explained priori, all data series used in this study are from widely recognized and accepted sources on which the majority of literature in this research area is based. The annual reports and official websites of the data sources comprehensively provide the mechanism adopted to collect data and also the methodology employed to quantify certain indices. Therefore, it can be ensured that the data series used for this study are both reliable and valid.

4. Empirical Results

Rule of Law and Free Press

Table 03 presents key results of the study: *first*, it shows OLS estimates for three regression equations with three different corruption indices for the dependent variable; and *second*, it reports IV-2SLS estimates. Since IV-2SLS estimates are more consistent than OLS estimates due to the issue of endogeniety, our interpretations are primarily based on IV-2SLS estimates.

The coefficient of determination (R-squared value) is satisfactorily high across all the models. Referring to IV-2SLS models, for instance, the variation of the chosen explanatory variables explain 92.5 per cent of the variation of the level of corruption measured in terms of CPI. As indices of corruption, the values reported on WGI and ICRG are 92.4 and 87.3 per cent, respectively.

According to Table 03, the coefficients for rule of law are statistically significant in both the OLS and IV-2SLS results confirming that a country's rule of law is a main determinant of its public sector corruption. Further, the positive sign of the coefficients indicates that a higher degree of rule of law leads to higher corruption indices, thus signaling that higher performance in terms of rule of law leads to lower corruption levels in the countries. In other words, the countries whose agents are more confident in the rule of society, quality of contracts, property rights, the police, and courts are less corrupt and vice versa. Akano *et al.* (2013) argue that a country's rule of law promoted by an independent judiciary and police services would build the confidence level of its citizenry in established institutions lowering the likelihood of public sector corruption. These findings of Akano *et al.* (2013) are consistent with those of Leite and Weidmann (1999), Fisman and Gatti (2002), and Ali and Isse (2003). Salih (2013) in his estimations uses rule of law as a proxy for the judiciary system and proves that a better judiciary system results in lower probability of perceived corruption. Likewise, using a dynamic general equilibrium model, Croix and Delavallade (2011) estimate that a weak legal system favours public sector corruption.

Resultantly, it is evident that the link between rule of law and corruption is adequately documented. However, this study solves the issue of endogeneity associated with rule of law by employing suitable instrumental variables, namely the legal origin of countries and the fact that whether a country is having a presidential government functions properly.

TABLE 03
Model Estimation Results

	OLS Estimation			Instrumental Variable [2SLS] estimation		
	CPI	WGI	ICRG	CPI	WGI	ICRG
Political Environment						
Rule of law	18.4113***	0.9801***	1.1516***	12.5671***	0.5538***	0.6987**
	(1.3788)	(0.0655)	(0.1043)	(3.6417)	(0.1997)	(0.2944)
Unicameral legislature	0.5176	0.0129	-0.0399	-0.3173	-0.0479	-0.1046
	(1.0856)	(0.0528)	(0.0916)	(1.3108)	(0.0726)	(0.1113)
Press freedom index (inv)	93.7611***	4.8686***	6.3508***	122.8796***	6.9928***	8.6070***
	(24.3246)	(1.1132)	(1.8267)	(35.5009)	(1.8223)	(2.4966)
E-government index	10.5265*	0.5952**	0.8862*	15.4011**	0.9508**	1.2638**
	(5.9096)	(0.2876)	(0.5098)	(6.9720)	(0.3961)	(0.6062)
Limited government	0.0834	0.0023	0.0009	0.0339	-0.0012	-0.0029
	(0.0541)	(0.0024)	(0.0040)	(0.0616)	(0.0050)	(0.0046)
Open markets	-0.0407	-0.0042	-0.0067	0.0797	0.0046	-0.0026
	(0.0633)	(0.0030)	(0.0044)	(0.0922)	(0.0050)	(0.0074)
Federal states	1.7765	0.0408	0.0712	2.2303	0.0739	0.1063
	(1.5918)	(0.0781)	(0.1162)	(1.6438)	(0.0869)	(0.1216)
Women in Legislature	0.0327	0.0019	0.0049	0.0320	0.0020	0.0048
	(0.0613)	(0.0023)	(0.0050)	(0.0581)	(0.0029)	(0.0046)
Military in politics	-0.8888*	-0.0635***	-0.0998**	-0.2107	-0.0140	-0.0472
	(0.4576)	(0.0229)	(0.0407)	(0.4986)	(0.0279)	(0.0485)

(Table 03 continued)

(Table 03 continued)

Baseline Controls						
Urbanization rate	0.8087	0.0421	0.0772	1.8322***	0.1168***	0.1565**
	(0.6609)	(0.0347)	(0.0571)	(0.6892)	(0.0391)	(0.0698)
Landlocked dummy	-1.6136	-0.0705	-0.2745**	-1.5441	-0.0654	-0.2692**
	(1.8981)	(0.0851)	(0.1214)	(1.8293)	(0.0839)	(0.1173)
Gini index (inv)	-131.2268	-8.0884	4.7507	-142.4855	-8.9097	3.8784
	(119.7964)	(4.9889)	(9.0631)	(124.0619)	(5.9604)	(9.1776)
Log (Per capita income)	-0.1395	0.0175	-0.0953	1.5525	0.1409*	0.0357
	(1.1054)	(0.0487)	(0.0921)	(1.4041)	(0.0755)	(0.1303)
Major religion (Islam)	0.5998	0.0152	0.0520	-0.6106	-0.0730	-0.0417
	(1.4026)	(0.0735)	(0.1513)	(1.6238)	(0.1004)	(0.1751)
Major religion (Christianity)	-0.0046	0.0119	0.0265	-1.9140	-0.1273	-0.1214
	(1.5885)	(0.0713)	(0.1246)	(1.7713)	(0.0981)	(0.1645)
Constant	37.3704***	-0.2813	3.0915***	11.3989	-2.1759**	1.0791
	(10.0124)	(0.4837)	(0.7468)	(16.1085)	(0.8877)	(1.4526)
Observations	121	121	121	121	121	121
Adjusted R-squared	0.937	0.948	0.892	0.925	0.924	0.873
Wooldridge's test statistics				1.7467	1.6600	1.2700
(P-value)				(0.4175)	(0.4360)	(0.5299)
Durbin-Wu-Hausman test				3.5538	7.5023	3.3554
(P-value)				(0.0594)	(0.0062)	(0.0670)

Note: Robust standard errors are in parentheses below the coefficients. Also, ***, **, * indicate statistical significance at the 1, 5, and 10 percent error levels, respectively.
Source: Own calculations.

The coefficients for press freedom are statistically significant and positive even at one per cent error level. This clearly indicates that greater freedom of the press is associated with less public sector corruption. This finding is robust across all six models and also consistent with the findings of many studies (for instance see Brunetti and Weder, 2003; Shen and Williamson, 2005; Pellegrini and Gerlagh, 2007; Chaudhry and Glulam, 2007; Altunbas and Thornton, 2012).

E-Governance

In the context of contemporary public sector, ICT plays a significant role in delivering a country's public services to its citizenry. Basically, the objective of the ICT based service system - a core of e-governance - is to integrate economic, social, and environmental goals through an institutional inter-linkage, where e-governance initiatives are expected to bring about greater efficiency, better service delivery, and higher level of citizen participation. Presenting a case of Fiji, Pathak *et al.* (2009) show that ICT-enabled service delivery can effectively curb public sector corruption. According to their calculations, the correlation coefficient between IT initiatives and corruption reduction is +0.995, which is almost a positive perfect correlation. Further, drawing on data for 208 countries together with instrumental variable regressions, Murillo (2013) notes that web presence of the government reduces the perception of public sector corruption. As a result, Murillo recommends international assistance for web-based service delivery initiatives of the government sector.

This paper's main contribution to corruption literature is that we incorporate the whole idea of e-governance through "e-governance development index" used as an explanatory variable in the analyses. Online public service delivery is one of the key components of e-governance. However, the degree of online service delivery through means, such as national central portals, e-services portals and e-participation portals and the websites of ministries differ from country to country in terms of their features, content, and the level of services offered. Accordingly, without limiting to government web presence, the e-governance development index encompasses the nature of telecommunication infrastructure in terms of the variables, such as number of Internet users, mobile subscribers, fixed broadband facilities and so forth. Moreover, this index recognizes the importance of human capital in successfully implementing a system of e-governance in a country. Therefore, the e-governance index considers adult literacy rate and the combined primary, secondary, and tertiary gross enrollment ratio to account for human development.

Our analyses clearly show that e-governance reduces the level of public sector corruption. As shown in Table 03, the coefficients for e-governance are positive and statistically significant across all six models. However, the results are stronger in IV- 2SLS models, which are also considered to be more consistent estimates. For instance, as Table 03 demonstrates, the coefficients are significant at five per cent error level in IV-2SLS estimates as well as 10 per cent error level in

the majority of OLS estimates. According to IV-2SLS results, one unit increase in e-governance development index will increase CPI by 15.4, WGI by 0.95, and ICRG by 1.26 units.

Results reflected from Baseline Controls

The coefficients for the variable urbanization are statistically significant and positive across all three IV-2SLS models, being a robust determinant of corruption. According to the results, the countries with higher rates of urbanization are less corrupt. It is likely that with urbanization people become more and more aware of public sector corruption and its nature. Billger and Goel (2009) point out that the concentration of people in urban areas gives way for room for frequent interaction between potential rent-seekers and rent-payers. This connotes that in rural areas people are relatively less aware of and exposed to public sector institutions and service delivery processes and, therefore, more likely to be potential rent-payers. Similarly, using cross-country data for 100 countries, Goel and Nelson (2011) argue that a higher urbanization rate is more likely to reduce the level of public sector corruption, which this study also corroborates based on consistent IV-2SLS estimates for the selected 121 countries.

Moreover, as shown in Table 03, countries with higher per capita income levels are less corrupt in terms of WGI though per capita income is not a robust determinant of corruption. Literature documents that a higher GDP per capita leads to a lower degree of corruption perception (Kotera *et al.*, 2010; Ata and Arvas, 2011; Altunbas and Thornton, 2012; Salih, 2013). However, our results show that GDP per capita plays a relatively minor role in reducing the perception of public sector corruption. Furthermore, it was interesting to note that landlocked countries are more corrupt than coastal countries. Table 03 shows that the coefficient for "landlocked dummy" is negative and significant only when ICRG is used as the dependent variable. Generally, landlocked developing countries are less involved in international trade when compared with coastal countries due to longer transportation time to reach transit countries and complex local custom procedures and services (Africa Infrastructure Knowledge Program, 2011). This complexity is likely to result in higher levels of public sector corruption in these countries. Yet, being a landlocked country was not found a robust determinant of corruption because it does not generate a significant impact on corruption measured in terms of both CPI and WGI.

It was also evident from our analyses that being a unicameral legislature and its rate of women's participation, being a federal state, size of government, and the openness of markets do not have an impact on the perception of public sector corruption. Finally, it was noted that the main religion of countries, military in politics, and income distribution were also not significant determinants of corruption in the public sector.

5. Conclusion and Policy Recommendations

This study contributes to the existing body of corruption literature as it proposes suitable instrumental variables to evaluate the impact of rule of law on public sector corruption having recognized the issue of endogeniety. Accordingly, being a former British colony or a Spanish colony together with being a presidential government at present were found to be satisfactory IVs for rule of law. This study did find that rule of law and freedom of press as significant determinants of public sector corruption. Therefore, strengthening rule of law by building people's confidence in the rule of society, improving quality of contracts, ensuring property rights, and making the police and courts independent is recommended as a key policy measure to curb corruption in public sector. It is also recommended that ensuring press freedom, as a policy measure, can successfully combat public sector corruption.

Further, the study found strong evidence to support the association between e-governance practices and the perception of public sector corruption. Therefore, we propose e-governance practices as effective policy tools for reducing corruption. Increasing the level of government web presence, promoting ICT-enabled public services, and improving related human capital can be listed as some of these policy measures.

Further, based on the finding that increased urbanization is accompanied by decreased public sector corruption, policies that promote urbanization can be suggested as indirect measures to fight corruption. Also, as the analyses show that landlocked countries are more corrupt, we propose that such countries need special attention when formulating global policies to combat public sector corruption.

By challenging traditional literature on corruption, we showed that being a unicameral legislature, women's participation in legislature, being a federal state, size of public sector, openness of markets, military in politics, and the main religion of countries do not have significant impacts on corruption. Likewise, we do not prove that level of corruption is affected by income distribution measured in terms of Gini index. However, this study was based on cross-sectional data for 121 countries for the year 2012. Therefore, it does not account for the dynamics of public sector corruption in countries. Future research is expected to employ more comprehensive panel data to account for the dynamics and structural changes in level of public sector corruption in countries.

References

Africa Infrastructure Knowledge Programme (2011) *Key message for transport sector*. Tunisia: African Development Bank Group.

Akano AY, Ogunseye TO, Bada OT and Agbeyangi BA (2013) The socio-economic determinants of corruption in Nigeria. *European Journal of Humanities and Social Sciences* 19(1): 923-938.

Ali AM and Isse HS (2003) Determinants of economic corruption: A cross-country comparison. *Cato Journal* 22(3): 449-466.

Altunbas Y and Thornton J (2012) Fiscal decentralization and governance. *Public Finance Review* 40(1): 66-85.

Ata AY and Arvas MA (2011) Determinants of economic corruption: A cross-country data analysis. *International Journal of Business and Social Science* 2(13): 161-169.

Billger S M and Goel R K (2009) Do existing corruption levels matter in controlling corruption?: Cross-country quantile regression estimates. *Journal of Development Economics* 90(2): 299-305.

Brunetti A and Weder B (2003) A free press is bad news for corruption. *Journal of Public Economics* 87: 1801-1824.

Cameron M, Blanaru A and Lesley B (2006), The separation of powers reconsidered: Presidentialism and the rule of law. In: *The Annual Meeting of the American Political Science Association*, Philadelphia, USA, 31 August-3 September 2006, pp.1-36. Philadelphia: American Political Science Association.

Chaudhry MA and Glulam S (2007) Determinants of corruption in developing countries. HWWI Research Paper, No. 2-11, Hamburg Institute of International Economics (HWWI), Germany, November.

Committee on Legal Affairs and Human Rights (2013) *Corruption as a threat to the rule of law*, Reference 3915 Third part-session, Parliamentary Assembly, Council of Europe.

Croix D de la and Delavallade C (2011) Democracy, Rule of Law, Corruption Incentives, and Growth. *Journal of Public Economics Theory* 13 (2): 155-187.

Dreher A and Herzfeld T (2005) The Economic Costs of Corruption: A Survey and New Evidence. Available at http://dx.doi.org/10.2139/ssrn.734184 (Accessed 2 January 2014).

Fedotov Y (2012) Where corruption flourishes, development and the rule of law fail. *United Nations Office on Drugs and Crime*, Press Release on 24th September, 2012, New York.

Fisman R and Gatti R (2002) Decentralization and corruption: evidence across countries. *Journal of Public Economics* 83 (3): 325-345.

Fisman R and Svensson J (2000) Are corruption and taxation really harmful to growth. Policy research working paper, No. 2485, The World Bank, USA, November.

Fritzen S A , Serritzlew S and Svendsen G T (2014) Corruption, Trust and their Public Sector Consequences: Introduction to the Special Edition. *Journal of Comparative Policy Analysis: Research and Practice*, 16(2): 117-120, DOI: 10.1080/13876988.2014.896124

Ghura D (1998) Tax revenue in Sub-Saharan Africa: Effects of economic policies and corruption. IMF working paper, No. 98/135, International Monetary Fund, USA, September.

Ginsburg T (2011) Pitfalls of measuring the rule of law. *Hague Journal on the Rule of Law* 3: 269-280.

Goel R and Nelson M (2011) Government fragmentation versus fiscal decentralization and corruption. *Public Choice* 148(3): 471-490.

Gupta S, Davoodi H and Terme RA (1998) Does corruption affect income inequality and poverty. IMF working paper, No. WP/98/76, International Monetary Fund, USA, May.

Kotera G, Okada K and Samreth S (2010) A study on the relationship between corruption and government size: the role of democracy. Available at http://mpra.ub.uni-muenchen.de/25015/ (accessed 2 January 2014).

La Porta R, Shleifer R and Vishny W (1998) Law and Finance. *Journal of Political Economy* 106 (6):1113-1155.

Leite C and Weidmann J (1999) Does mother nature corrupt? Natural resources, corruption, and economic growth. IMF Working paper, No. WP/99/85, International Monetary Fund, USA, July.

Licht AN, Goldschmidt C and Schwart SH (2003) Culture rules: The foundations of the rule of law and other norms of governance. Working paper No. 605, William Davidson Institute, USA, August.

Murillo MG (2013) Does a government web presence reduce perceptions of corruption? *Information Technology for Development* 19(2):151-175.

Pathak RD, Naz R, Rahman MH, Smith RFF and Agarwal KN (2009) E-governance to cut corruption in public service delivery: A case study of Fiji. *International Journal of Public Administration* 32: 415-437.

Pellegrini L and Gerlagh R (2007) Causes of corruption: a survey of cross-country analyses and extended results. *Economics of Governance* 9(3): 245-263.

Salih MAR (2013) The determinants of economic corruption: A probabilistic approach. *Advances in Management & Applied Economics* 3(3):155-169.

Seligson MA (2002) The impact of corruption on regime legitimacy: A comparative study of four Latin American countries. *The Journal of Politics* 64 (2): 408-433.

Senior I (2006) *Corruption - the world's Big C: cases, causes, consequences, cures*. London: The Institute of Economic Affairs in association with Profile Books.

Shabbir G and Anwar M (2007) Determinants of corruption in developing countries. *Pakistan Development Review* 46 (4):751-764.

Shen C and Williamson JB (2005) Corruption, Democracy, Economic Freedom, and State Strength: A Cross-National Analysis. *International Journal of Comparative Sociology* 46 (4): 327-345.

Sung HE (2004) Democracy and political corruption: A cross national comparison. *Crime, Law & Social Change* 41: 179-194.

Tanzi V and Davoodi HR (2000) Corruption, Growth, and Public Finances. IMF working paper, No. WP/00/182, International Monetary Fund, USA, November.

Transparency International (2010) *Exploring the relationships between corruption and tax revenue*, U4 Expert Answers, No. 228, January, Berlin.

Transparency International (2013) Corruption Perceptions Index 2013. (Berlin: Transparency International).

Treisman D (2000) The causes of corruption: A cross-national study. *Journal of Public Economics* 76 (3): 399-457.

Uslaner EM (2009) Corruption, In: G. T. Svendsen and G. L. H. Svendsen (Eds) *The Handbook on Social Capital* (London: Edward Elgar), pp. 127–142.