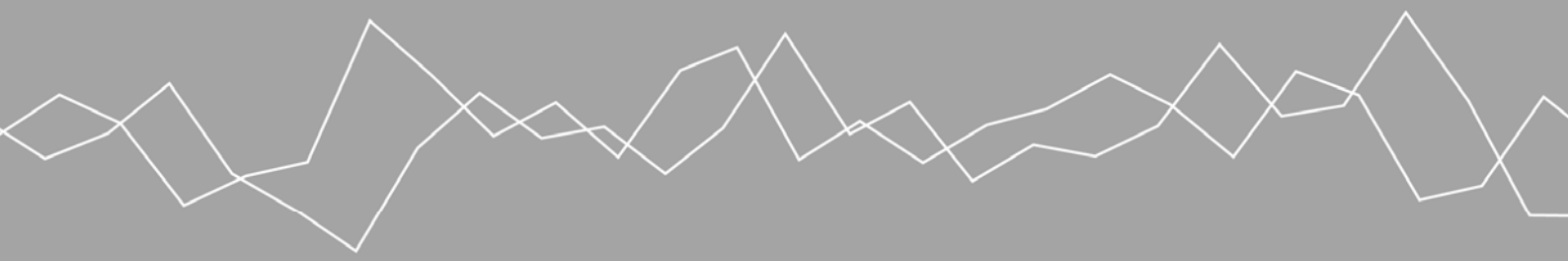
An econometric analysis of tourism inflow in Curaçao: can Tourism Price Indices help us out?



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An econometric analysis of tourism inflow in Curaçao: can Tourism Price Indices help us out?

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Abstract:

In theory, prices are an important factor in explaining tourism demand. Empirically however, the role of price is not so evident, due to the use of very different and often theoretically inappropriate definitions. As expenditure patterns of tourists and local consumers are very different, this paper wants to analyse if our TPI is a better performing tool in empirical research than the commonly used CPI. The (preliminary) results show that theoretical superiority is not reflected in empirical results: statistical improvements are present but only very marginally. This might partially be due to insufficient distinctive power of our TPI, but it is just as probable that at the moment of decision making local prices are just not so important after all.

JEL Codes: C51, C52, D12.

Keywords: small island tourism economy; price elasticities; tourism demand; tourism prices.

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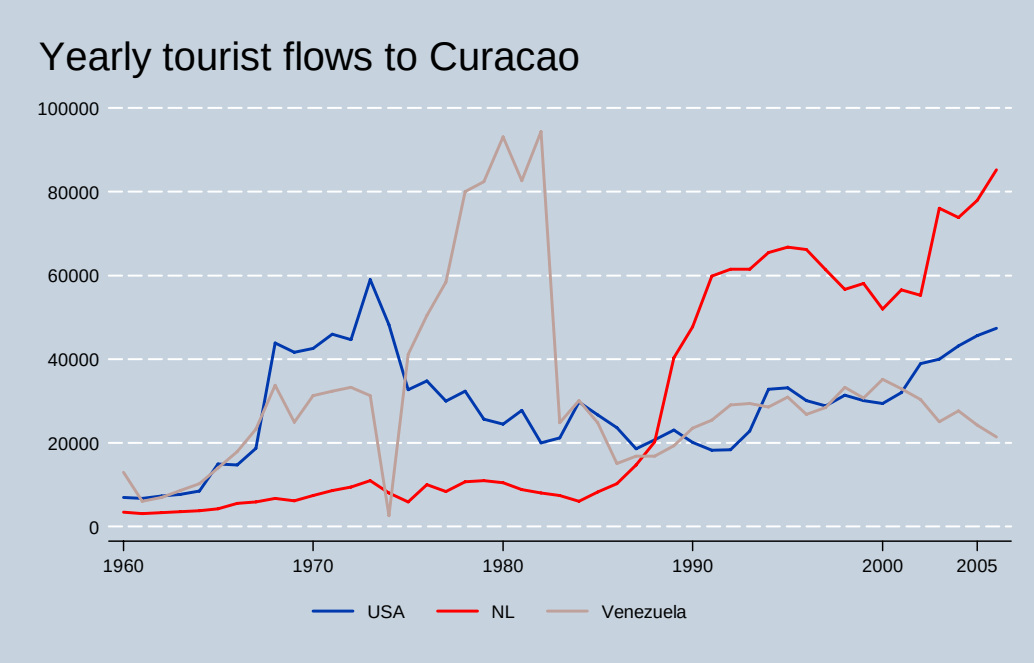
1 Introduction

The flow of stayover tourists to Curaçao has been measured quite accurately for a long time and allows to distinguish between the three traditionally largest countries of origin: the United States, the Netherlands and Venezuela. Figure 1 shows the long-term trends.

Figure 1 Stayover tourist arrivals in Curaçao, 1960-2006



Source: CTB (2007).

Some remarkable shifts can be identified in these patterns. American tourism peaked during the seventies but then more than halved in the following decennium without obvious reason. Venezuelans come in large quantities while their currency was still strong but their drop from 94 thousand visits in 1982 to 25 thousand the next year coincides with an important monetary crisis causing high inflation and falling exchange rates. Dutch tourism suddenly shifted upwards by 20 thousand per year since 2003 after important developments in aviation: monopoly on the Netherlands-Curaçao route was undermined, which caused capacity to increase sharply and ticket prices to drop rapidly. Furthermore, developments in other substitute tourism countries (i.e. the Bali bombings) could have also played an important role.

Which factors exactly are driving these tourist flows is difficult to measure but in theory prices are of major importance. Empirically though, the role of prices in tourism demand is not so evident: most of the literature points out that price elasticities of demand are insignificantly small or zero (Crouch, 1994; Croes & Vanegas, 2005). Price is a more complex concept than for example income, and a lot of the problems in establishing price effects are due to the use of very different and often inappropriate definitions of price.

Most research on tourism uses local CPI in a certain form. But the expenditure patterns of local consumers and of tourists are very different (see a.o. Pérez Mira, 2002), especially in a small island tourism economy like Curaçao. This makes the CPI a less precise instrument to analyse price elasticities of tourists; to enable such research for Curaçao in the near future we have constructed a Tourism Price Index (TPI), based on observed expenditure patterns of different types of tourists. In this paper we want to test if our TPI is indeed a better performing tool to use in empirical research than the more easily available CPI.

2 Tourism demand and the role of prices

The role of prices in the empirical explanation of tourism demand patterns is central to this paper. We try to investigate on that using data on the small island tourism economy of Curaçao. Similar research has already been carried out for the neighbouring island of Aruba (Croes & Vanegas, 2005), resulting in significant income elasticities and no significant effect of price on tourist demand. In other words: tourism demand to this Caribbean island is not influenced by local prices. Several other studies are known on this topic for other countries, but so far they all share the same problem: the measurement of price elasticities varies. Crouch has published an excellent overview including an attempt to integrate through meta-analysis several studies using all kinds of definitions of price (Crouch, 1992), but remains inconclusive on the most useful specification for a price variable. So far only one paper has explicitly investigated the appropriateness of a Tourism Price Index (Martin & Witt, 1987) concluding that in the origin-destination pairs of their study the local CPI and a special TPI performed more or less equal. That paper considered only medium sized countries like Austria, Greece, Portugal or even larger countries (France, Spain). We will look specifically at the case of small island tourism economies.

2.1 Definitions of price in tourism demand models

In the context of understanding the demand for tourism to a country one of the most important economic factors is price. The price that matters though has multiple dimensions, essentially:

a) the exchange rate between the origin and destination country's currencies.
b) the costs of travelling to and from the destination country
c) the composite price of goods & services consumed by tourists in the destination country (preferably relative to prices in the origin country)

Next to these three factors prices in alternative destination countries (competing or complementary) may also be relevant, as is of course disposable income of the tourist. Income is often proxied by measure of the GDP per capita in a given year in the origin country, and included as a separate variable in economic modelling. But a (weighted) measure of substitute

prices for alternative destinations, or complementary prices for complementary countries is very hard to construct and therefore not often applied satisfactory in international literature. To distinguish to what extent countries are complements and to what extent they are substitutes one needs specific data which are not easily collected.[1] In this paper we will only regard direct prices and investigate their possible role in explaining tourism demand.

2.1.1 Exchange rates

Exchange rates are an important dimension of price, not only for converting local prices to the origin country's currency but also as an independent signalling factor on its own. At the time of deciding what country to visit, tourists are often unaware of local price changes while exchange rate developments are published every day. Thus, exchange rates are more directly perceived and often used as the prime indicator for local prices (Gray, 1966; Witt & Witt, 1992). The exchange rate has "proven to be a relevant factor in the consumer's decision making process" but on its own "not an acceptable proxy" for other price variables.[2] The problem however with including the exchange rate variable together with CPI or TPI is that it always causes multicollinearity. In this study we estimate multiple equations: some using both a price variable and the exchange rate, some using only price variables expressed in the origin country's currency (that is: corrected for changes in the exchange rate).

2.1.2 Transport costs

The costs of travelling to a small island tourism country are difficult to measure and, sadly enough, can only be incorporated in this paper indirectly. Knowing that the mode of travel is always by air (cruise tourism is excluded from our analysis), two problems occur in our case:

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1 We do not believe in simply assigning countries to one of these categories by 'expert opinion'. To explain this for the case of Curacao: next to the island are two other islands, Aruba & Bonaire, which can be considered very similar alternatives for the Dutch tourist market because all are part of the former Dutch colony of the Netherlands Antilles. Only Curacao happens to be the biggest of the three. Now should we look at Aruba as a competing destination or a complementary destination? Dutch tourist can spend their money only in one place at a time. But both islands are so small, that tourists can easily combine them both in a traditional two-weeks holiday trip, which is easily facilitated by most airlines. Is their alternative not to go to Aruba (or Bonaire) and spend all their money in Curacao? Or would they just leave the island after one week already? Or are they only making this (relatively) expensive long-haul trip *because* they can combine multiple destinations, meaning the alternative is to spend their holidays somewhere in Europe? To collect reliable information on the degree of substitution & complementarity one would have to apply advanced techniques like conjoint analysis in an individual survey.

2 Martin & Witt (1987), pp. 245.

- Transport costs are mostly paid long before the tourist arrives and collected by a foreign company in the origin country; they have no direct effect on the local economy and therefore there is no need to register them locally. This of course is not true if the tourism destination country has it's own national airline but in the Caribbean that is not often the case. Even if so, American and European airline networks and holiday charters are dominant.
- Airline companies are very reluctant to give any price information, anxious not to give away sensitive information to their market competitors.

This doesn't mean we are left completely without information: we already mentioned a discrete change in Dutch tourism in 2003, induced by allowing more than one airline to operate on the Amsterdam-Curaçao route. Capacity increased, prices fell and tourism boomed. That last effect (included as a dummy variable) will appear significant in all the models in this paper, but it is not proven to be strictly an effect of price. Capacity was also increased on this route in 1989 by the monopoly airline, this also increased a boom in tourism but of course not in prices. In the absence of better information, the focus of this paper will be on the prices of goods & services consumed by tourists, in the destination country itself.

2.1.3 Composite price of goods & services consumed by tourists in the destination country

A major theoretical problem is that the local CPI is not reflecting tourist prices, which may explain why many studies (including Croes & Vanegas) find no significant price elasticities of tourism demand Although a TPI is theoretically superior, it has been argued that in most cases a CPI is a reasonable alternative because the tourist mix of goods & services consumed is similar to the local mix or because the changes in the prices of the different goods are more or less the same. While that may hold for relatively large countries with a large internal market characterised by competing suppliers and by residents dominating demand, the argument may be less valid for small island tourism economies (like Curacao and other Caribbean islands). Here tourism is a fundamental part of the local economy, clearly dominating demand in several sectors. In this paper we try to analyze if the use of a specific TPI will yield better estimates than the traditional CPI.

2.2 The Curaçao Tourism Price Index

Until recently the only price information available for tourism demand models for Curaçao was the official consumer price index published by the Antillean Central Bureau of Statistics (CBS). Although this is sufficient for converting current prices into constant prices, to answer the question questions '*Has Curaçao recently become a more expensive destination for tourist from country X?*' the CPI is not the right tool. Tourists have very different expenditure patterns than local consumers. Table 1 gives an overview of the different expenditure patterns of tourists and local consumers, as it emerges from the CTB Expenditure Survey 2003.[3] It shows that tourists spend more on accommodation: 41% of the tourist budget in 2003 has gone to accommodation while locals spend 26% on housing (accommodation is not even included as a category in the CPI). Tourists also spend twice as much on food as the local consumers.

Table 1 Budget shares TPI and local CPI (broad categories)

	TPI	*CPI*
Food	33%	15%
Beverages and tobacco	0%	2%
Clothing and footwear	5%	8%
Housing	0%	26%
Household furnishing and appliances	0%	9%
Medical care	0%	2%
Transportation and communication	11%	20%
Recreation and education	5%	8%
Miscellaneous	5%	10%
Accommodation	41%	0%

Source: CTB expenditure survey 2003, CBS Statistical Info Prices.

These differences are incorporated in a new tourist price index specifically weighting the prices that matter for tourists. we calculate this TPI in a similar way as the CPI is constructed: by recording price developments for a lot of products & services, and establishing how important these products are for the average local customer. Separate price developments are weighted with the average expenditure pattern of tourists instead that of local customers. A more detailed categorization is used then presented in the table above, combining official price indices of 40 different products with tourism expenditure patterns recorded in official survey data.[4] This enables us for example to distinguish between supermarket prices and prices of outdoor

consumption, among others. The resulting index reflects the overall development of prices for products that tourists consume on the island. Basically the calculation just looks like:

$$TPI_t = \sum_{i=1} (exshare_i \times price_{i,t})$$

where

i = index for good 1, 2, …. 40

t = indicator for year 1989, 1999, …. 2006.

exshare = share of good *i* in the tourist budget

price = detailed index for good *i* in year *t*

Detailed indices are collected from the CBS and presented in Table 9 in the Appendix. Some minor extra calculations are involved in transforming the series from a monthly based 'feb.1996=100' to a yearly based '2000=100'. The omission of prices for accommodation however is not minor: while we are still hoping to collect information at least for the most recent years, in the current version we still use the price index of 'housing' as a proxy for the costs of accommodation. This of course has consequences for the interpretation of results as it introduces extra measurement error in the main independent variable.

Table 2 shows the development of both CPI and TPI in recent years. Typical stayover prices in Curaçao have risen slightly more than local consumer prices, but the gap is very small and even decreasing since the last two years.

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3 See Berkhout et al (2006c) for a detailed description of this data.
4 See Table 7 and Table 8 in the appendix for details.

Table 2 Price developments for local customers (CPI) and tourists (TPI)

	Index		Yearly change	
	CPI	TPI	CPI	TPI
1989	74.5	73.2		
1990	77.3	76.0	3.8%	3.9%
1991	80.3	79.0	3.9%	3.9%
1992	81.5	80.1	1.5%	1.5%
1993	83.2	81.8	2.1%	2.1%
1994	84.6	82.5	1.7%	0.9%
1995	87.0	85.4	2.8%	3.5%
1996	90.0	89.0	3.6%	4.4%
1997	93.1	92.5	3.3%	3.8%
1998	94.1	93.0	1.1%	0.6%
1999	94.5	93.9	0.4%	0.9%
2000	100.0	100.0	5.8%	6.6%
2001	101.8	102.7	1.8%	2.7%
2002	102.1	103.5	0.3%	0.8%
2003	104.3	106.1	2.2%	2.6%
2004	105.7	107.3	1.3%	1.1%
2005	109.3	110.0	3.4%	2.5%
2006	113.0	113.3	3.4%	3.0%

Source: own calculations based on CBS and CTB.

3 Is a TPI more useful?

Knowing the theoretical superiority of TPI, the most important question remains: 'Does our TPI empirically prove to be a clearly better instrument than CPI in tourism demand models?'. To test this we applied both the CPI and the TPI in several specifications of macro-economic tourism demand models.

3.1 Data

Apart from the price variables mentioned before (available only since 1989) we collected additional variables applying the definitions used in the World Development Indicator (WDI) database on all other sources. The WDI database was our main source for the historical series (from 1960-2004). These series are updated using the sources mentioned in Table 3, after checking congruency. Unfortunately reliable GDP-data for Aruba could not be found (WDI contains only 8 years) so we had to drop that country from our analyses. For Venezuela data are only complete till 2004.

Table 3 Recent data sources, 2005-2006

	United States	Netherlands	Venezuela
Population (mid-year)	www.census.gov	www.cbs.nl	-
GDP (current prices, local currency)	www.bea.gov	Eurostat mio_nac series (since 1969)	-
Exchange rate	www.oanda.com	www.oanda.com	www.oanda.com
Inflation (annual, consumer prices)	www.bls.gov	www.cbs.nl (CPI alle huishoudens)	-

3.2 Variable definitions and model specification

For our estimations we transformed the original income variable to represent real income per capita (in local currency units of the year 2000), and the inflation data to indices (base 2000=100). Given the important institutional differences between the three countries in their relation with the destination country, we estimate separate models for each country. As log-log specifications are considered most appropriate in tourism demand models we take logs of all independent variables and the dependent variable, the number tourist arrivals in Curaçao in year t of tourists.

Allowing for habit persistence or long-term adjustments, we include one lagged term of the dependent variable (given that we have not many data points considering more lags would not be appropriate).

We estimate each model once with CPI's and once with TPI's. But how exactly should we combine local prices, origin prices and exchange rates? Crouch (1994) sums no less than 7 different ways to incorporate price information in a model.[5] For our study two of them are relevant, defined as model 1 and model 6:

- model 1 uses prices in the destination country relative to origin prices,
- model 6 uses just prices in the destination country.

Model 1 reflects the idea that a country is still cheaper if prices rise relatively modest, because the 'real price' drops. This definition is comparable to the one used by Martin & Witt (1987). Given that we express income in real terms as well, this should separate the price effect (substitution effect) from the income effect so that a negative sign is expected.[6] Model 6 is also estimated because this specification is often reported in other research; although we believe that model 1 is more useful we still want to compare TPI and CPI in this specification as well. It's implications are clear, it ought to bring up a negative own-price elasticity following standard economic theory. With as few data as we have (18 observations for US & NL, 16 for Venezuela) it is not possible to incorporate both local and origin price variables in the same model: they are heavily correlated and cause large multicollinearity. As a Curacao holiday is no inferior good, income elasticity estimates should be positive.

Model 1 becomes:

$$\ln(arr)_t = \alpha + \beta_1 \ln(realGDPcap_{lcu})_t + \beta_2 \ln(arr)_{t-1} + \beta_3 \ln(exrate)_t + \beta_4 \ln\left(\frac{cpi_{local}}{cpi_{\text{home}}}\right)_t$$

[5] Of these however only 5 are fundamentally different; 2 are just reciprocals.

[6] If destination prices remain constant but origin prices rise sharply the real price drops but the income effect will be larger than the price effect, thereby causing a positive price elasticity measurement. By including a real income variable as well, this effect should be picked up by the income variable as well.

Model 6 becomes:

$$\ln(arr)_t = \alpha + \beta_1 \ln(realGDPcap_{lcu})_t + \beta_2 \ln(arr)_{t-1} + \beta_3 \ln(exrate)_t + \beta_4 \ln(cpi_{local})_t$$

Rethinking both specifications, and considering the small time period available, it might be statistically more efficient to reduce the number of variables by expressing the price variable in currency units of the origin country (LCU's) as well.

Model 1a then becomes:

$$\ln(arr)_t = \alpha + \beta_1 \ln(realGDPcap_{lcu}) + \beta_2 \ln(arr)_{t-1} + \beta_4 \ln\left(\frac{cpi_{local}}{cpi_{home}} \cdot exrate\right)$$

Model 6a then becomes:

$$\ln(arr)_t = \alpha + \beta_1 \ln(realGDPcap_{lcu}) + \beta_2 \ln(arr)_{t-1} + \beta_4 \ln(cpi_{local} \cdot exrate)$$

Finally, for the Dutch estimations a specific dummy is included for the shift in tourism following airline market liberalization in 2003. The TPI-specifications are similar to the ones mentioned above, only substituting local TPI for local CPI.

3.3 Estimation results

The detailed output is given in the appendix (Table 10 through Table 15), but Table 4 summarizes the main results from our estimations: the values of the different specifications of our price variables. Only significant results are shown, the best performing model in terms of F-statistic is shown in bold. For the US models 1 and 6 are equivalent to 1a and 6a because the Antillean Guilder/US dollar rate is fixed since the start of our analysis.

Table 4 Price elasticity estimates using CPI & TPI in four different specifications

	US	NL	NL*	Ven	Ven*
relative inflation CPI (model 1)	**-4.94**	n.s		-0.52	
local inflation CPI (model 6)	n.s.	n.s		n.s.	
relative inflation CPI, origin currency (model 1a)			-0.76		-0.50
local inflation CPI, origin currency (model 6a)			-0.78		n.s.
relative inflation TPI (model 1)	n.s.	n.s		-0.52	
local inflation TPI (model 6)	n.s.	n.s		n.s.	
relative inflation TPI, origin currency (model 1a)			**-0.76**		**-0.51**
local inflation TPI, origin currency (model 6a)			-0.78		n.s.
Model specification:					
includes GDP per capita & arrivals last year	yes	yes	yes	yes	yes
includes exchange rate	no	yes	no	yes	no
includes country-time specific dummy	no	yes	yes	no	no
degrees of freedom left (n-k-1)	14	12	13	11	12

Source: own calculations.

Several things are striking: for the US the estimated price elasticity is much higher than for the other countries, and for the Netherlands the separate inclusion of the exchange rate cancels out all significant price effects. Apparently, the price effects found here are solely driven by the exchange rate component. This however can not be said from for Venezuelan tourists price elasticity. Here the inclusion of the exchange rate does not seem to influence the other variables very much (see Table 14 & Table 15 in the appendix), although on itself the exchange rate coefficient is significant. Interestingly enough, model characteristics are slightly more favourable for the type 1a models without specific exchange rates.

Although for both the Netherlands and Venezuela the best TPI-model performs better than the best CPI-model, one has to admit that the differences are not really breathtaking. Our TPI does practically duplicate the results of the CPI, only with a little bit more accuracy. At least the elasticity estimates that the models come up with are unaffected. In the present status (both excluding airfare costs and without specific accommodation prices available) there is no clear necessity to prefer one over the other.

TPI or CPI does not matter much for the income elasticities in the model, variation between model 1 and model 6 is more prominent here. If found significant, real income elasticity is always positive and in most cases fall in the range of 0.6 to 0.9. The latter happens when prices are expressed in relative forms (all variations on model 1 & 1a) except for the US where no

significant income elasticities are found. The aviation liberalization dummy for the Netherlands, associated with a sudden drop in prices, is relevant and consistent in all specifications.

Because we included lagged dependent variables in our specification we should test for autocorrelation. Although reported often in similar studies, the normal Durbin-Watson *d*-statistic is not valid in this situation so we use Durbin's alternative *h*-statistic which does not require all regressors to be strictly exogenous. For each of our model specifications we ran this test, Table 5 shows the p-values for the null hypothesis that there is no autocorrelation.[7] Only the three US-models that did not come up with significant price elasticities appear to have an autocorrelation problem. We ran these models again using Cochrane-Orcutt estimation to correct for this problem and the results remained the same: no significant price elasticity.

Table 5 p-values for Ho: no autocorrelation

	usa	nl	ven
cpi1		0.328	0.098
cpi6		0.877	0.944
cpi1a	0.451	0.282	0.208
cpi6a	0.007	0.439	0.372
tpi1		0.111	0.102
tpi6		0.839	0.907
tpi1a	0.044	0.228	0.191
tpi6a	0.013	0.398	0.372

Source: own calculations.

Regarding the interpretation of empirically estimated price elasticities in general, one should keep in mind that especially in these small island tourism economies local demand is partially affected by tourism demand (small island economies have less flexible supply), which means that changes in the number of tourists might influence local prices. On the other hand local prices might influence tourist demand, which is the interpretation that tourism economics literature mostly gives. But if demand and prices are interdependent in a small island country, one should take care when assigning causality, more so than in large countries where the demand of residents is dominating total demand.

[7] Given the small sample size we explicitly use t-distribution p-values.

4 Concluding remarks

The main conclusion of this paper is that, in its present state, our Tourism Price Index is only very marginally more efficient than the CPI, it is by no way reflecting its theoretical superiority in empirical use. Secondly, local prices and exchange rates are very interrelated. In many specifications, the exchange rate appears to have more significance than either TPI or CPI. These conclusions have several explanations and implications:

- We do need sharper price information on accommodation. Originally we expected to be able to get some information on rack rates of accommodation, at least for the recent years. Unfortunately we had to do without and substitute local housing-CPI for that, thereby decreasing the distinctive power of the TPI. An important part of variation in costs between tourists and local consumers might still be missing.
- So far we have used the same TPI for every tourist origin country. In practice, we could do the same analyses with tailor-made TPI's using expenditure patterns of different types of tourists to calculate different TPI's. In the end however, we expect differences be marginal for US & Dutch tourist, Venezuela might be affected somewhat. This extension will only be relevant after price information for accommodation is available, though.
- Local tourism prices might not the most important part of costs as perceived by the tourist when he decides where to go:
    - people may based decisions mainly on the prices perceived directly up-front in the origin country: the hotel price and the airline ticket price, often bundled in a package deal. The omission of airline ticket prices is a well known omission in tourism economics time series studies, and in our study that is probably increasing misspecification errors;

  - local prices are perceived only with a lag (through oral family-and-friends networks), while the exchange rate is perceived more directly and therefore maybe more important in the decision making process;
  - the exchange rate is often also more volatile than local prices: if exchange rate-adjusted prices are used the price component might really don't matter that much but the variable may be merely reflecting changes in exchange rates. This is of course most relevant for intercontinental tourism;
  - if all of the above is true, we might even say that in this case our TPI is 'just as worse' as the CPI in explaining tourism demand, because local prices do not matter at all.

- If no TPI is available in a country, a CPI might be a reasonable instrument to use for measuring tourist prices. If detailed information on prices of accommodation and restaurants are available, together with tourist expenditure surveys the construction of a TPI is easy and should definitely be done. This could clearly help expand the international literature on TPI validation, which we believe is of special importance for small island tourism economies.

To be more certain about these conclusions, we are still striving for improvement on our present analysis. As soon as we have incorporated time series on accommodation prices we will of course report an update. In the mean time, we like to discuss the problems and possibilities of using TPI instead of CPI to improve price elasticity estimates with other tourism economists at the 1st conference of the International Association for Tourism Economics in October 2007, and hopefully gain some extra insights that we can use for future improvement in our contribution to scientifically based tourism economics research. We acknowledge that this paper is only a small step into this debate, and some giant leaps have still to be made: by us, by other researchers and also by statisticians producing detailed price indices. Although our paper is based on only one destination country, we think it addresses all small island tourism economies specifically.

Appendix

Table 6 Tourist arrivals in Curacao, 1960-2006

	USA	Venezuela	Netherlands	Rest	Total
1960	6,912	12,954	3,415	7,577	30,858
1961	6,722	6,003	3,082	6,966	22,773
1962	7,258	6,933	3,261	6,292	23,744
1963	7,665	8,538	3,489	15,737	35,429
1964	8,501	10,267	3,812	15,605	38,185
1965	14,982	14,063	4,286	11,159	44,490
1966	14,653	17,907	5,489	17,780	55,829
1967	18,691	23,328	5,937	15,289	63,245
1968	43,895	33,764	6,750	17,132	101,541
1969	41,567	24,939	6,111	18,460	91,077
1970	42,514	31,297	7,396	18,501	101,641
1971	45,958	32,282	8,582	19,339	108,413
1972	44,649	33,235	9,387	18,828	108,150
1973	59,044	31,245	10,900	20,518	123,192
1974	48,237	2,611	7,979	26,317	86,441
1975	32,668	41,134	5,846	21,871	103,321
1976	34,819	50,426	10,050	19,817	117,037
1977	30,041	58,483	8,403	33,637	133,532
1978	32,383	79,992	10,771	49,146	173,834
1979	25,610	82,382	10,991	60,112	180,677
1980	24,500	93,137	10,443	54,976	184,671
1981	27,710	82,684	8,865	55,804	176,269
1982	20,015	94,350	8,007	51,158	174,405
1983	21,128	24,863	7,428	55,716	110,616
1984	29,748	30,130	5,960	63,287	130,003
1985	26,693	24,807	8,249	54,296	116,316
1986	23,681	15,119	10,277	73,877	130,146
1987	18,605	16,853	14,706	77,343	134,786
1988	20,718	16,857	20,278	89,949	155,106
1989	23,081	19,283	40,323	104,117	193,032
1990	20,123	23,524	47,784	110,044	207,673
1991	18,247	25,349	59,812	98,521	205,648
1992	18,353	29,033	61,445	96,176	206,942
1993	22,788	29,338	61,458	98,732	214,082
1994	32,745	28,618	65,510	96,544	226,132
1995	33,198	30,908	66,746	89,375	223,788
1996	30,079	26,797	66,219	88,562	214,325
1997	28,772	28,504	61,415	84,624	205,045
1998	31,420	33,215	56,624	75,268	198,570
1999	30,121	30,648	58,020	76,755	198,271
2000	29,338	35,098	51,917	72,211	191,246
2001	31,962	32,904	56,530	80,705	204,603
2002	38,947	30,389	55,256	91,415	217,963
2003	40,019	25,099	75,999	76,492	221,395
2004	43,105	27,639	73,798	74,796	223,439
2005	45,568	24,259	77,879	69,169	222,099
2006	47,396	21,426	85,212	72,793	234,249

Source: Curacao Tourist Board (2007).

Table 7 Tourist expenditure pattern, 2003

	Total expenditures in sample ($)	
accommodation expenses	1,854,539.23	41.04%
in hotel	593,552.23	13.14%
restaurant	698,825.23	15.47%
supermarket	168,207	3.72%
other	5,372	0.12%
rent a car	286,191	6.33%
taxi	56,040	1.24%
public transportation	6,087	0.13%
bus tour	11,066	0.24%
oil / petrol / gasoline	28,146	0.62%
trip to other island	2,941	0.07%
learn dive packages	17,763	0.39%
dive trips	69,545	1.54%
snorkel etc	20,324	0.45%
yacht etc	2,966	0.07%
equipment purchase	2,114	0.05%
equipment rental	6,601	0.15%
other	11,999	0.27%
electronics/cameras	13,953	0.31%
toys /sports	3,760	0.08%
jewellery expenses	80,055	1.77%
perfume expenses	71,919	1.59%
clothing expenses	214,820	4.75%
sundry books expenses	3,368	0.07%
duty free expenses	13,038	0.29%
other expenses	32,398	0.72%
admission charges expenditures	37,456	0.83%
casino expenditures	46,999	1.04%
admission nightclub expenses	6,713	0.15%
expenditures bars & pubs	27,572	0.61%
other expenses attractions	4,815	0.11%
tax at the airport	109,311	2.42%
overall other expenses	10,281	0.23%
	4,518,736	100%

Source: Own calculations based on CTB Expenditure Survey 2003.

Table 8 Budget shares TPI and local CPI

	TPI	TPI main cat.	CPI
FOOD		**3305**	**1466**
Cereal products	0		232
Meat and fish	0		369
Fats and cooking oils	0		42
Dairy products (except butter)	0		124
Potatoes, vegetables and fruits	0		232
Sugar and chocolate	0		45
Prepared food	0		72
Outdoor-consumption	2921		260
Food n.e.s.	384		90
BEVERAGES AND TOBACCO		**0**	**233**
Beverages	0		192
Tobacco	0		41
CLOTHING AND FOOTWEAR		**475**	**754**
Clothing	475		607
Footwear	0		147
HOUSING	0	**0**	**2647**
Dwelling cost	0		1740
Energy expenses	0		371
Maintenance of dwelling	0		217
Garden maintenance	0		68
Water	0		251
HOUSEHOLD FURNISHING AND APPLIANCES		**0**	**879**
Furniture and illumination	0		162
Upholstery and dwelling-textile	0		87
Household apparatus	0		158
Household articles	0		82
Household expenses n.e.s.	0		118
Domestic services	0		141
Household furnishing n.e.s.	0		131
MEDICAL CARE		**0**	**203**
Medical care	0		203
TRANSPORTATION AND COMMUNICATION		**1106**	**1991**
Transport vehicles in ownership (not for business use)	0		571
Expenses for own transport vehicles (not for business use)	62		755
Transport services	1044		311
Communication	0		354
RECREATION AND EDUCATION		**510**	**818**
Recreation	291		451
Entertainment and culture	212		64
Books etc	7		80
Education	0		220
Hobby articles	0		3
MISCELLANEOUS		**499**	**1009**
Personal body care	159		264
Insurances	0		244
Commodities and services n.e.s.	340		501
ACCOMODATION	**4104**	**4104**	**0**
Total	*10000*	*10000*	*10000*

Table 9 Detailed price indices for tourist demand relevant goods & services (feb 1996=100)

	w	1989	1996	2000	2001	2002	2003	2004	2005	2006
Outdoor consumption	*2921*	81.8	103.6	115.4	118.1	121.5	122.1	123.4	126.1	129.4
Food n.e.s.	*384*	82.2	101.3	110.5	111.8	114.9	117.5	120.2	126.1	134.9
Clothing	*475*	95.2	100.3	105.6	105.2	103.2	102.6	102.2	103.2	103.8
Housing	0	83.4	101.4	115.1	118.5	120.9	128.2	130.1	134.3	139.3
Expenses for own transport	*62*	80.5	102.2	121.6	123.9	124.0	125.9	128.6	139.3	145.2
Transport services	*1044*	85.5	101.4	117.0	125.2	114.1	111.8	111.9	112.5	113.5
Recreation	*291*	87.3	100.4	103.7	102.2	100.9	100.9	100.6	99.7	99.4
Entertainment and culture	*212*	85.0	101.0	111.3	112.3	112.7	114.1	114.9	117.2	119.5
Books etc	*7*	85.6	100.9	124.0	126.0	126.1	123.6	125.6	129.4	131.6
Personal body care	*159*	83.9	100.7	117.7	118.8	119.1	119.7	119.6	120.5	122.7
Commodities and services	*340*	84.0	101.7	112.4	114.0	114.8	116.3	117.9	120.7	124.2
Accommodation	4104	not available, housing is used as a proxy								

Source: CBS.

Table 10 Price elasticity estimates using CPI in four different specifications, US

	model 1a		model 6a	
GDP per capita (real prices lcu 2000)	0.89		0.61	
arrivals last year	0.48	**	0.60	**
destination CPI relative to origin CPI	-4.94	**		
destination CPI			0.53	
constant	-3.95		-4.58	
Number of observations	18		18	
Adjusted R-squared	0.87		0.83	
F	39.5		27.8	
degrees of freedom (n-k-1)	14		14	

legend: * p<.1; ** p<.05; *** p<.01

Table 11 Price elasticity estimates using TPI in four different specifications, US

	model 1a		model 6a	
GDP per capita (real prices lcu 2000)	1.42		0.34	
arrivals last year	0.55	**	0.58	**
destination TPI relative to origin CPI	-3.06			
destination TPI			0.67	
constant	-10.14		-2.27	
Number of observations	18		18	
Adjusted R-squared	0.84		0.83	
F	30.7		28.6	
degrees of freedom (n-k-1)	14		14	

legend: * p<.1; ** p<.05; *** p<.01

Table 12 Price elasticity estimates using CPI in four different specifications, Netherlands

	model 1		model 6		model 1a		model 6a	
GDP per capita (real prices lcu 2000)	0.65	**	-1.36		0.62	**	1.41	***
dummy for KLM-monopoly (t=2003)	0.15	*	0.14	*	0.15	*	0.18	**
arrivals last year	0.25	***	0.12		0.26	***	0.32	***
exchange rate (price of destination currency)	-0.78	***	-0.66	***				
destination CPI relative to origin CPI	-0.38							
destination CPI			2.01					
destination CPI relative to origin CPI, expressed in origin currency					-0.76	***		
destination CPI, expressed in origin currency							-0.78	***
constant	1.12		13.81	*	1.41		-3.78	
Number of observations	18		18		18		18	
Adjusted R-squared	87%		90%		88%		86%	
F	24.03		30.4		32.16		26.28	
degrees of freedom (n-k-1)	12		12		13		13	

legend: * p<.1; ** p<.05; *** p<.01

Table 13 Price elasticity estimates using TPI in four different specifications, Netherlands

	model 1		model 6		model 1a		model 6a	
GDP per capita (real prices lcu 2000)	0.69	***	-0.65		0.69	***	1.47	***
dummy for KLM-monopoly	0.13	*	0.14	*	0.15	**	0.18	**
arrivals last year	0.27	***	0.16		0.26	***	0.32	***
exchange rate (price of destination currency)	-0.72	***	-0.74	***				
destination TPI relative to origin CPI	-1.46							
destination TPI			1.22					
destination TPI relative to origin CPI, expressed in origin currency					-0.76	***		
destination TPI, expressed in origin currency							-0.78	***
constant	0.6		9.72		0.68		-4.42	
Number of observations	18		18		18		18	
Adjusted R-squared	88%		88%		89%		86%	
F	26.12		26.27		34.57		27.43	
degrees of freedom (n-k-1)	12		12		13		13	

legend: * p<.1; ** p<.05; *** p<.01

Table 14 Price elasticity estimates using CPI in four different specifications, Venezuela

	model 1		model 6		model 1a		model 6a	
GDP per capita (real prices lcu 2000)	0.79	**	0.19		0.87	***	0.23	
arrivals last year	0.53	***	0.61	***	0.51	***	0.69	***
exchange rate (price of destination currency)	-0.53	***	-0.14					
destination CPI relative to origin CPI	-0.52	***						
destination CPI			1.76					
destination CPI relative to origin CPI, expressed in origin currency					-0.50	***		
destination CPI, expressed in origin currency							0.00	
constant	-3.72		-6.1		-4.91		-0.25	
Number of observations	16		16		16		16	
Adjusted R-squared	0.82		0.61		0.83		0.58	
F	17.71		6.9		24.9		7.98	
degrees of freedom	11		11		12		12	

legend: * p<.1; ** p<.05; *** p<.01

Table 15 Price elasticity estimates using TPI in four different specifications, Venezuela

	model 1		model 6		model 1a		model 6a	
GDP per capita (real prices lcu 2000)	0.77	**	0.25		0.83	***	0.23	
arrivals last year	0.53	***	0.62	***	0.51	***	0.69	***
exchange rate (price of destination currency)	-0.53	***	-0.13					
destination TPI relative to origin CPI	-0.52	***						
destination TPI			1.49					
destination TPI relative to origin CPI, expressed in origin currency					-0.51	***		
destination TPI, expressed in origin currency							0.00	
constant	-3.45		-6.03		-4.37		-0.24	
Number of observations								
Adjusted R-squared	16		16		16		16	
F	0.82		0.60		0.83		0.58	
degrees of freedom	18.1		6.6		25.8		8.0	

legend: * p<.1; ** p<.05; *** p<.01

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