Appendix A

Let E_1 and E_2 be the set of all values of $F_{\mu_1}(n)$ and $F_{\mu_2,\beta}(x)$ with the exception of 0 and 1. By definition, a bivariate random variate (N, X) belongs to the FGM family of distributions if its joint cdf is given by (9), where (see Cambanis, 1977) $\sigma_{\inf} \leq \sigma \leq \sigma_{\max}$, where

$$\begin{aligned} \sigma_{\min} &= -\min\left\{\frac{1}{M_1 M_2}, \frac{1}{(1-m_1)(1-m_2)}\right\}, \\ \sigma_{\max} &= \min\left\{\frac{1}{M_1(1-m_2)}, \frac{1}{(1-m_1)M_2}\right\}, \end{aligned}$$

where $m_1 = \inf E_1 = 1/\mu_1$, $m_2 = \inf E_2 = 0^+$, $M_1 = \sup E_1 = 1^-$ and $M_2 = \sup E_2 = 1^-$. Therefore, it follows that the acceptable value for the parameter σ is the interval $(-1, 1)$.

The pdf given in (10) is derived from (9). First, this cdf is derived with respect to x to give

$$F^*_{\Theta,\sigma}(n, x) = \frac{\partial F_{\Theta,\sigma}(n, x)}{\partial x}$$

Second, the pdf is taken as

$$f_{\Theta,\sigma}(n, x) = F^*_{\Theta,\sigma}(n, x) - F^*_{\Theta,\sigma}(n-1, x),$$

from which, after simplifying, we obtain (10).

Appendix B

The cross moment, $E_\Theta(NX)$, can be computed as

$$\begin{aligned} E_{\Theta,\sigma}(NX) &= \int_0^\infty x \sum_{n=1}^\infty n f_\Theta(n, x)\, dx \\ &= \int_0^\infty x f_{\mu_2,\beta}(x) \left[H_{\Theta,\sigma}(x) \sum_{n=1}^\infty n[f_{\mu_1}(n)]^2 + \mu_1 G_{\Theta,\sigma}(x)\right] dx. \end{aligned}$$

Tedious but straightforward computations then provide

$$\begin{aligned} \sum_{n=1}^\infty n[f_{\mu_1}(n)]^2 &= \left(\frac{\mu_1}{2\mu_1 - 1}\right)^2, \\ \int_0^\infty x f_{\mu_2,\beta}(x) \bar{F}_{\mu_2,\beta}(x)\, dx &= M(\Theta), \end{aligned}$$

in which we use the following relation between the incomplete gamma function and the Kummer confluent hypergeometric function,

$$\Gamma(a,z) = \Gamma(a) - \frac{z^a}{a}\,{}_1F_1(a,a+1,-z) \tag{14}$$

and the fact that

$${}_2F_1(a,b,c,z) = \frac{1}{\Gamma(b)}\int_0^\infty t^{b-1}\exp(-t)\,{}_1F_1(a,c,tz)\,dt.$$

Recall that the Kummer confluent hypergeometric function is defined as

$${}_1F_1(a;b;z) = \frac{\Gamma(b)}{\Gamma(a)\Gamma(b-a)}\int_0^1 t^{a-1}(1-t)^{b-a-1}\exp(zt)\,dt.$$

Finally, the cross moment is obtained as

$$E_\Theta(NX) = \mu_1\mu_2\left[1 + \frac{\sigma(\mu_1-1)(2M(\Theta)-1)}{1-2\mu_1}\right],$$

while the covariance is given by

$$cov(N,X) = \frac{\mu_1\mu_2\sigma(\mu_1-1)(2M(\Theta)-1)}{1-2\mu_1}.$$

Appendix C. Data description

1. Total expenditure in the country of origin (i.e., flights and accommodation) and at the destination (on items such as restaurants and transport).

2. Length of stay (trip duration or number of nights) in the Canary Islands.

3. Household income. This item is measured in the survey as an ordered categorical variable and not as a continuous variable. It takes the following values: =1, from 12000 to 24000 €; =2, from 24001 to 36000 €; =3, from 36001 to 48000 €; =4, from 48001 to 60000 €; =5, from 60001 to 72000 €; =6, from 72001 to 84000 €; and =7, higher than 84000 €.

4. Vacation characteristics.

(a) Type of accommodation. Three types of variable are established. First, a dummy variable which takes the value 1 if the tourist accommodation is a 5-star hotel/aparthotel, and the value 0 otherwise. Second, a dummy variable which takes the value 1 for a 4-star hotel/aparthotel, and 0 otherwise. Finally, a dummy variable which takes the value 1 if the accommodation is a 1, 2 or 3-star hotel/aparthotel, and 0 otherwise. The reference category represents other types of accommodation such as the tourists' own property, or which belongs to friends or family, or campsites or apartments.

(b) Travel party size. The number of persons composing the holiday package paid for in the country of origin.

(c) Repetition. A dummy variable which takes the value 1 if the tourist has visited the Canary Islands previously, and 0 otherwise.

(d) Holidays. A dummy variable which takes the value 1 if the reason for the visit was to take a holiday, and 0 otherwise. The reference category represents a person who is visiting the Canary Islands on business, for professional reasons, to attend a congress, seminar or the like, for family reasons, etc.

5. Individual characteristics.

(a) Occupation. This variable contains the following categories: business owner, self employed, liberal profession, upper management employee, middle management employee, auxiliary level employee, other employee, student, retired, homemaker, unemployed. Three dummy variables are considered. Business owner takes the value 1 if the tourist is a business owner, and 0 otherwise. Self employed takes the value 1 if the tourist is self employed or has a liberal profession and 0 otherwise. Salaried worker takes the value 1 if the tourist works for a salary and 0 otherwise. The reference category is student, retired,homemaker and unemployed.

(b) Age of the survey respondent.

(c) Over 65 years old. Number of persons in the travel party size aged over 65 years.