Universidad de Valladolid

Escuela de Doctorado Universidad de Valladolid

PROGRAMA DE DOCTORADO EN ECONOMÍA

TESIS DOCTORAL:

Modelos de evaluación de eficiencia de los destinos turísticos: Los recursos culturales como factor determinante de la competitividad turística

Presentada por Mafalda Gómez Vega para optar al grado de Doctora por la Universidad de Valladolid

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Facultad de Comercio

Departamento de Economía Aplicada

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"Siempre estoy haciendo lo que no puedo hacer, para poder aprender cómo hacerlo"

Pablo Picasso

"Una palabra afable nada hace perder"

Ludwing van Beethoven

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vida académica. No me cabe duda de que me acompañareis también en la defensa de esta tesis doctoral. Gracias a mis amigos, a los que casi he abandonado en este proceso, pero que se mantienen al pie del cañón, comprensivos y atentos. Ojalá pueda estar a la altura de las cosas que habéis conseguido, académica y profesionalmente. A Pablo. Privilegiada me siento de compartir cada paso de estas tesis contigo: la tuya y la mía. Gracias por ayudarme incansablemente, aconsejarme con paciencia, por leer todos mis trabajos con atención y hasta por repasar sus bibliografías. Eres el gran regalo que me llevo de este periodo.

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ESTRUCTURA DE LA TESIS DOCTORAL

De acuerdo con la normativa vigente para la presentación y defensa de la tesis doctoral en la Universidad de Valladolid (aprobado por el Consejo de Gobierno en sesión de 3 junio de 2016. BOCyL nº114 de 15 de junio), esta tesis doctoral se presenta en la modalidad "tesis por compendio de publicaciones". En ella se incluyen un total de cinco artículos, los cuatro primeros ya publicados en revistas científicas y el quinto en proceso de revisión en el momento del depósito. Los artículos 1º, 3º y 4º están publicados en revistas indexadas WOS SSCI JCR, por lo que cumplen con los requisitos establecidos por la Comisión del Programa de Doctorado en Economía. A continuación se incluyen los artículos que conforman la tesis doctoral, así como la revista en la que están publicados y su base indexación. Se recoge también la filiación de los coautores.

1. Herrero-Prieto, L.C. and Gómez-Vega, M. (2017). Cultural resources as a factor in cultural tourism attraction: Technical efficiency estimation of regional destinations in Spain. *Tourism Economics*, 23(2), 260-280. Doi.org/10.1177/1354816616656248

   Indexación: WOS SSCI JCR Impact Factor (2017): 0.942. Subject: Economics (Q3; 217/353); Hospitality, Leisure, Sport & Tourism (Q4; 42/50)

2. Gómez Vega, M. y Herrero Prieto, L.C. (2017). Determinantes de la eficiencia en la captación de turismo cultural nacional y extranjero en España: Un análisis regional. *Estudios de Economía Aplicada,* 35(3), 849-872.

   Indexación: Thomson. Emerging sources citation index. Factor de Impacto IN-RECS (2009): 0.103. Subject: Economía (Q2; 33/87)

3. Figueroa-Arcila, V., Herrero-Prieto, L.C., Báez-Montenegro, A. and Gómez-Vega, M. (2018). Analysing how cultural factors influence the efficiency of tourist destinations in Chile*. International Journal of Tourism Research.* 20(1), 11-24. Doi.org/10.1002/jtr.2149

   Indexación: WO SSCI JCR Impact Factor (2017): 2.449. Subject: Hospitality, Leisure, Sport & Tourism (Q2; 15/50)

4. Gómez-Vega, M. and Herrero-Prieto, L.C. (2018). Achieving tourist destination competitiveness: Evidence from Latin-American and Caribbean countries. *International Journal of Tourism Research*. Doi.org/10.1002/jtr.2231

   Indexación: WOS SSCI JCR Impact Factor (2017): 2.449. Subject: Hospitality, Leisure, Sport & Tourism (Q2; 15/50)

5. Gómez-Vega, M. and Picazo-Tadeo, A. Ranking world tourist destinations with a composite indicator of competitiveness: To weigh or not to weigh? *Tourism Management*. (en 2ª ronda de revisión)

   Indexación: WOS SSCI JCR. Impact Factor (2017): 5.921. Hospitality, Leisure, Sport & Tourism (Q1; 1/50); Environmental Studies (Q1; 4/108); Management (Q1; 8/209)

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INTRODUCCIÓN

1. Justificación y objetivos de la tesis doctoral

La evaluación de la competitividad de los destinos turísticos es una línea de investigación relativamente reciente dentro del ámbito de estudio de la economía del turismo. Sin embargo, en los últimos años ha comenzado a recibir una atención cada vez mayor por parte de los investigadores, como se refleja en el número creciente de trabajos publicados, con gran diversidad, tanto en aplicaciones empíricas como en evolución metodológica, que incluso ha dado lugar a estudios de meta-análisis, como el recientemente publicado por Sainaghi et al. (2017). Esto hace de este ámbito de estudio una línea de trabajo consolidada con múltiples posibilidades de análisis, tanto en el desarrollo teórico y metodológico, como en sus comprobaciones empíricas.

Una de las principales razones de este auge radica en la creciente importancia económica que demuestra el sector turístico a nivel internacional, pero también por las transformaciones recientes que hacen del sector una rama productiva compleja y cada vez más extensa. En primer lugar, en términos de demanda, el sector turístico en la actualidad no es uniforme, sino que presenta una clara segmentación en forma de múltiples motivaciones para viajar, porque las preferencias de los individuos, en la actualidad, tampoco son uniformes (Lee, 2015). De este modo, no podemos seguir hablando solo del turismo de sol y playa, que responde a un patrón de comportamiento uniforme, tanto en demanda como en oferta, típico del fenómeno de la masificación y estandarización del turismo de finales del siglo pasado. Por el contrario, la extensión del turismo en la actualidad, viene dada por la amplitud del concepto de ocio en un sentido temporal y de jerarquía de valores y preferencias del individuo, respecto las decisiones de ocupación de su tiempo (Delgado, 2000 y Herrero, 2011a). En este contexto, han comenzado a surgir multitud de nuevas motivaciones turísticas que diversifican profundamente los usos del ocio y que dan lugar a flujos de turismo, como el turismo congresual, cultural, de negocios, médico, etc. (De Vita y Kyaw, 2016). En segundo lugar, por el lado de la oferta, el turismo presenta una imagen igualmente compleja. En la actualidad, el turismo es un fenómeno de escala global, recientemente han surgido multitud de destinos que multiplican las posibilidades de viajar, facilitado también por un abaratamiento e incremento de la accesibilidad. Si al hecho de que todo territorio se ha hecho global y es susceptible de ser visitado, sumamos la constatada capacidad de este sector para generar impacto y desarrollo económico, se hace evidente una tendencia natural a la competencia de los destinos turísticos. Por un lado entre países, que buscan acaparar los flujos turísticos internacionales; y de igual modo a escala interna, donde los enclaves pugnan por atraer flujos de visitantes domésticos o foráneos como una fuente de actividad y, por lo tanto, de desarrollo económico.

Este es el contexto en el que se enmarca nuestra tesis doctoral, cuyo planteamiento conceptual parte del marco teórico desarrollado por Crouch y Ritchie (1999; 2003), y posteriormente replanteado por autores como Dwyer y Kim (2003) y Hong (2009), en torno al análisis de la competitividad turística, tomando por objeto de estudio los destinos turísticos como unidad territorial de medida. La hipótesis subyacente de este planteamientos consiste en que los territorios disponen de una serie de recursos (culturales, naturales, dotaciones de ocio, infraestructuras, etc.), que determinan su capacidad de atracción turística y su competitividad. Estos recursos a su vez son demandados por los visitantes, cuyo resultado puede medirse no solo en términos estrictos de flujo turístico (número de turistas, pernoctaciones, etc.), sino también en forma de impacto económico (renta, gasto, empleo derivado, y finalmente efectos sobre el desarrollo económico). Por tanto, a partir de este planteamiento puede definirse una función de producción como relación entre inputs (recursos) y outputs (resultados), que en este planteamiento tiene una base territorial, y por lo tanto se fundamenta en un diseño virtual, característico de una demarcación espacial, tras la que no hay un intermediario responsable, pero que puede asimilarse al proceso de una compañía comercial al uso (Soyskal-Kurt, 2017).

A partir de este planteamiento la evaluación del rendimiento en la gestión del proceso productivo de los destinos turísticos, puede considerarse un terreno fecundo de aplicación de modelos de optimización, ya que se fundamenta en la maximización de unos resultados, a partir de unos recursos. La cuantificación de su desempeño puede enfocarse metodológicamente desde diversos puntos de vista, como los modelos de evaluación de la eficiencia, entre los que destaca por su aplicabilidad el Análisis Envolvente de Datos o DEA, por sus siglas en inglés. Esta metodología permite evaluar la gestión en términos de optimización de resultados dado un nivel de recursos, generando un índice relativo de la eficiencia para cada uno de los destinos considerados y conformando una frontera de eficiencia a partir de los casos óptimos (Suzuki et al. 2011). Por otro lado, existen modelos que van un paso más lejos, como la metodología de eficiencia condicionada en dos etapas, ya que incorporan en su análisis el efecto que sobre la eficiencia en la gestión ejercen diferentes factores ambientales y externos, estimado por medio de un modelo de regresión. Por último, el concepto de evaluación de la competitividad de los destinos turísticos permite aplicar interesantes modelos de indicadores sintéticos, que aun cuando no son capaces de evaluar el proceso productivo en sí mismo, ofrecen como resultado información claramente interpretable sobre la acumulación de recursos o atractivos que favorecen la competitividad de los destinos (Mendola y Volo, 2017).

Siguiendo el planteamiento conceptual expuesto, cabe señalar a continuación los objetivos que tratamos de alcanzar con esta tesis doctoral y que pueden resumirse principalmente en dos. El primer objetivo consiste en el estudio y aplicación de diferentes modelos de evaluación de la eficiencia y de la competitividad de los destinos turísticos, lo que comporta un diseño metodológico adaptado a cada uno de los supuestos de estudio que vamos a acometer. De este modo vamos a contemplar, tanto distintas unidades de desempeño turístico de entidades territoriales, como diferentes hipótesis sobre la conformación de la función de producción y sus determinantes externos. Y finalmente también, distintos procedimientos estadísticos y econométricos de evaluación de la eficiencia.

Como segundo objetivo, vamos a prestar especial atención a determinar el papel de los recursos culturales como factor determinante de la eficiencia turística, lo que entronca claramente con la línea de investigación en economía de la cultura, en relación a cuestiones analíticas relativas al consumo cultural, y al vínculo que se establece entre cultura, turismo y desarrollo económico. Partimos del planteamiento de que la cultura supone un recurso de gran valor para los destinos, ya que los dota de identidad y otorga ventajas competitivas frente a sus rivales (Cracolici et al. 2008). Por tanto, su acumulación supone un atractivo clave para determinar su visibilidad como destino potencial y de igual modo condicionar de forma positiva el flujo turístico que recibe. La constatación de este efecto y su contribución al desarrollo económico, no obsta para considerar también posibles efectos perniciosos en términos de congestión y banalización cultural (Riganti y Nijkamp, 2008). Tal y como argumenta Jamal et al. (2010), no administrar de forma correcta estos recursos culturales puede ser perjudicial para el turismo, generando situaciones de aglomeración, inseguridad, etc., afectando claramente a su competitividad. Además, este efecto negativo es cuantificado empíricamente en el trabajo de Cuccia et al. (2016), donde se concluye que la acumulación de declaraciones UNESCO, puede ser contrario a la eficiencia de los destinos turísticos.

Los anteriores objetivos se han materializado en un total de cinco estudios, que a su vez, han dado lugar a cuatro publicaciones, a las que se suma una en trámite de revisión. Estos estudios reflejan la trayectoria de investigación de la doctoranda a lo largo del periodo de formación doctoral y conforman la principal aportación de la tesis en forma de compendio de publicaciones. Cada uno de estos trabajos se incorpora al documento a modo de capítulo diferenciado. Todos ellos parten de un planteamiento común, la medición de la competitividad turística por medio de modelos de eficiencia condicionada en dos etapas, en los que se combina la evaluación de la eficiencia de los destinos turísticos con el análisis de la incidencia de factores externos. No obstante, cada trabajo presenta un diseño diferente, adaptado a cada caso de estudio y tratando de aportar novedades conceptuales y

metodológicas que doten de una mayor riqueza explicativa al proyecto doctoral en su conjunto. Además, se ha desarrollado a lo largo de los artículos una evolución en el procedimiento analítico, que nos ha permitido alcanzar planteamientos más refinados desde el punto de vista estadístico y econométrico. Tanto las aportaciones conceptuales, como la evolución del planteamiento metodológico se resumen en la Tabla 1, y se desarrollan a continuación.

Los dos primeros capítulos y artículos responden a un planteamiento común, que tiene como objetivo observar el vínculo existente entre la acumulación de recursos culturales y la atracción de demanda con motivación específicamente cultural, dentro del contexto turístico español. Para ello se ha definido una función de producción compleja con una escala de análisis territorial regional. En ella se incorporan como inputs, por un lado, el factor trabajo directamente relacionado con el ámbito del turismo cultural, y por otro, una síntesis de los principales atractivos culturales radicados en los destinos (patrimonio histórico, museos y festivales), a modo de dotaciones de capital. Mientras que como output a maximizar, se contempla únicamente el flujo de turistas que manifiestan una motivación propiamente cultural. Esta supone la principal aportación de estos trabajos, pues desde nuestro conocimiento no existen estudios de evaluación de la eficiencia de destinos turísticos que se ciñan estrictamente al flujo de turismo cultural. En cuanto a la metodología empleada, se ha acometido el análisis de eficiencia por medio de DEA con un procedimiento bootstrap, que permite obtener intervalos de confianza de los resultados, y éste se ha combinado con un análisis de regresión truncada, a fin de observar el efecto de variables externas sobre el nivel de eficiencia alcanzado. Como se ha dicho, fruto de este mismo planteamiento se han realizado dos trabajos (Capítulos 1 y 2), cuya principal diferencia viene dada por el output considerado. Mientras que en el primero se realiza un estudio de los turistas culturales de origen nacional, en el segundo se aplica el modelo sobre el flujo de turistas internacionales y nacionales. Sin embargo existe un matiz metodológico, ya que en el caso de los turistas domésticos se consideran a aquellos que han manifestado una motivación propiamente cultural, mientras que para los turistas internacionales, y debido a la limitación de la base de datos, se analizan los turistas que realizan consumos culturales durante su visita, con independencia de la motivación. Esto impide acumular los datos y estudiar el flujo turístico como un todo, pero resulta pertinente, de algún modo, la comparación de casos.

Tabla 1. Síntesis metodológica y aplicaciones de la investigación doctoral

Artículo	Caso de estudio		Metodología	Función de producción			Variables externas
	Muestra	Flujo turístico		Tipo	Inputs	Outputs	
Cultural resources as a factor in cultural tourism attraction: Technical efficiency estimation of regional destinations in Spain	17 regiones españolas en 5 años (2004-2012); Panel de datos.	Turismo Cultural nacional	Eficiencia condicionada en dos etapas; DEA-CRS-Output-oriented (Bootstrap) y regresión truncada.	Compleja	Festivales culturales; museos; patrimonio histórico y empleo cultural.	Flujo de turistas culturales nacionales	Declaraciones UNESCO de patrimonio cultural; camas disponibles en alojamientos hoteleros; camas disponibles en alojamientos hoteleros de 3,4 y 5 estrellas; km de autopistas; km de costa; parques naturales; gasto cultural; empresas culturales; seguridad; tendencia; turismo no cultural; turismo cultural internacional.
Determinantes de la eficiencia en la captación de turismo cultural nacional y extranjero en España: Un análisis regional.	17 regiones españolas en 5 años (2004-2012); Panel de datos.	Turismo Cultural Nacional e Internacional.	Eficiencia condicionada en dos etapas; DEA-CRS-Output-oriented (Bootstrap) y regresión truncada.	Compleja	Festivales culturales; museos; patrimonio histórico y empleo cultural.	Flujo de turistas culturales totales, nacionales e internacionales.	Declaraciones UNESCO de patrimonio cultural; camas disponibles en alojamientos hoteleros; camas disponibles en alojamientos hoteleros de 3,4 y 5 estrellas; km de autopistas; km de costa; parques naturales; gasto cultural; empresas culturales; seguridad; tendencia;
Analysing how cultural factors influence the efficiency of tourist destinations in Chile.	15 regiones chilenas en 6 años (2009-2014); Panel de datos.	Turismo Total Nacional e Internacional	Eficiencia condicionada en dos etapas; DEA-CRS-Output-oriented (Bootstrap) y regresión Tobit, Tobit robusto y bootstrap.	Gerencial/simple	Camas en alojamientos hoteleros; Llegadas de turistas.	Pernoctaciones de turistas	Patrimonio histórico; reservas naturales; monumentos naturales; áreas salvajes protegidas; seguridad; gasto público en cultura; visitantes en áreas protegidas; visitantes en áreas salvajes; km de carreteras; acceso internet; número de cines; aforo de cines; empleo cultural; agencias de viajes.
Achieving tourist destination competitiveness: Evidence from Latin-American and Caribbean countries.	17 países latinoamericanos y del caribe en 5 años (2011-2015); Panel de datos.	Turismo total Internacional	Eficiencia condicionada en dos etapas; DEA-VRS-Output-oriented (Simar y Wilson doble bootstrap)	Gerencial/simple	Camas en alojamientos hoteleros; Llegadas de turistas internacionales	Pernoctaciones de turistas internacionales	Declaraciones UNESCO de patrimonio cultural; declaraciones UNESCO de patrimonio natural; áreas protegidas: PIB per cápita; seguridad; despegues de aerolíneas; internet; dummy Isla; tendencia.
Ranking world tourist destinations with a composite indicator of competitiveness: To weigh or not to weigh?.	136 países a escala internacional en el año 2017.	Indicadores de competitividad turística	DEA-SBM-"Beneficio de la Duda"-MCDM-Regresión Simar y Wilson	Operativa	Input unitario	88 indicadores de competitividad del World Economic Forum	PIB turístico; IDH; índice de globalización; control de la corrupción; calidad de la democracia; costa; dicotómicas de continente.

Fuente: Elaboración Propia

El tercer capítulo constituye otra aplicación empírica que, frente a los estudios anteriores, contiene dos novedades en el planteamiento. En primer lugar, se analiza todo el turismo completo, cualquiera que sea la motivación de su viaje, y se considera tanto el turismo doméstico como el internacional, partiendo de un análisis territorial de escala regional, aplicado en el caso del sector turístico de Chile. En segundo lugar, se plantea una función de producción gerencial, en la que se acomete un análisis básico de optimización del flujo turístico, cuantificado por medio del input número de pernoctaciones, en relación a la capacidad de alojamiento y la llegada de turistas, como inputs. Como se ha indicado anteriormente, se realiza el estudio a escala territorial micro, en este caso para las regiones chilenas, lo cual supone una aportación en sí misma, puesto que no existen un gran número trabajos de evaluación de la eficiencia de los destinos turísticos en el contexto latinoamericano, Sin embargo, cabe destacar que resulta en la actualidad un escenario especialmente interesante, debido al desarrollo y diversificación turística que está manifestando en los últimos años. El efecto determinante de los recursos culturales sobre la eficiencia, se cuantifica por medio del análisis de regresión, donde se han incluido como factores explicativos, entre otros, factores relativos a la oferta cultural y recursos naturales. En cuanto a la aportación metodológica, el análisis de eficiencia se realiza de igual modo en base a un modelo DEA con bootstrap, mientras que como novedad, se han implementado tres modelos de regresión diferentes, Tobit, Tobit Robusto y Bootstrap, que permiten obtener resultados comparables y más consistentes.

En el Capítulo 4 se plantea un análisis conceptualmente similar al anteriormente expuesto, según una función de producción puramente gerencial de optimización estricta del flujo turístico, en el que se analiza el número de pernoctaciones de turistas internacionales, de nuevo sin motivación manifestada, en base a la capacidad de alojamiento hotelero y a las llegadas de turistas internacionales. Si bien, la principal novedad de este estudio radica en el cambio de escala analizado, ya que pasamos de las unidades territoriales micro, como las regiones, al análisis macro por medio de una muestra de países de Latinoamérica y el Caribe. De nuevo, resulta especialmente pertinente dada la importancia creciente que está desarrollando este espacio geográfico para el turismo internacional, además de representar un área homogénea a escala mundial, tanto por motivos geográficos como por idiosincrasia cultural. Este planteamiento macro es menos habitual, debido a la necesidad de encontrar una muestra con características de homogeneidad, a lo que se suma el importante esfuerzo que se requiere para la compilación de datos comparables para diferentes países. Por otra parte, dado el planteamiento del análisis a escala país de un área geográfica homogénea, el flujo turístico considerado se refiere estrictamente al turismo internacional y no al doméstico. De nuevo se incorpora el análisis del impacto de los factores culturales por medio

de un modelo de regresión, donde se aporta la segunda novedad de este planteamiento, ya que en este caso se emplea el procedimiento de eficiencia condicionada en dos etapas planteado por Simar y Wilson (2007), y que trata de evitar los diferentes sesgos que se atribuyen a la combinación de DEA con análisis de regresión truncada convencional, obteniendo intervalos de confianza para los coeficientes de la estimación.

Por último, el capítulo 5 supone un trabajo que de igual manera busca cuantificar la competitividad de los destinos turísticos, si bien en este caso se plantea por medio de la construcción de indicadores compuestos, tratando de sintetizar los atractivos que hacen competitivo a un país. De nuevo se realiza el estudio a escala macro, tomando una muestra de países a nivel internacional y en base a los datos que publica el World Economic Forum (WEF, 2017). La principal aportación del estudio, consiste en proponer un indicador compuesto de competitividad con un esquema de pesos alternativos al modelo de medias simples que emplea el WEF para la construcción del *Travel & Tourism Competitivenes Report* (T&TCR). El modelo empleado para la construcción del indicador sintético resulta novedoso y a su vez entronca con la metodología empleada en los anteriores trabajos, aplicando de nuevo el DEA, pero en este caso en base a su orientación de "Beneficio de la Duda" (Cherchye et al., 2004). Por el momento, no contamos con referencias previas de su uso para la construcción de indicadores sintéticos de competitividad turística, y de ahí la novedad metodológica del estudio. Este modelo nos permite generar unos pesos endógenos, lo que puede llevar a unos cálculos más objetivos que los del WEF. Además, el trabajo se completa con un análisis del efecto de variables de entorno por medio de un modelo de regresión, según las mejoras aportadas al modelo por Simar y Wilson (2007). En este caso, de igual manera, se da importancia a observar el efecto de los recursos culturales sobre la competitividad. Estos se incorporan como una de las principales variables a sintetizar en el indicador compuesto, pudiendo cuantificar su efecto por medio del peso que el modelo le otorga sobre la construcción del índice compuesto.

Esta ha sido nuestra trayectoria de investigación doctoral, que da lugar, como hemos dicho, a un total de cinco trabajos, que se presentan como capítulos diferenciados en el cuerpo del presente documento. No obstante, y previamente a la relación ordenada de artículos, se realiza una breve síntesis sobre la importancia del sector turístico y el turismo cultural, como marco general de la investigación, así como dos epígrafes complementarios de síntesis de la metodología empleada y el *estado del arte* en el ámbito de los estudios de la eficiencia de los destinos turísticos. Con ello pretendemos situar nuestras contribuciones en el seno de la discusión científica general. Además, se incorpora un resumen de lo que consideramos las principales aportaciones alcanzadas en el desarrollo de nuestra investigación.

2. La importancia del turismo y del turismo cultural.

El turismo es uno de los sectores productivos que más rápido crece a escala internacional, consolidándose en la actualidad como un factor clave para el crecimiento económico nacional y regional (Noonan y Rizzo, 2017), y que pugna en términos de volumen de negocio con industrias que a lo largo de la historia reciente han sido claves para el desarrollo económico (Mendola y Volo, 2017), como por ejemplo la industria de los carburantes o la de la automoción (UNWTO, 2018). Este crecimiento no solo debe entenderse en términos absolutos, sino también en diversidad y complejidad del sector, lo cual se manifiesta, por el lado de la oferta, en una profunda diversidad reflejada en el surgimiento de nuevos destinos turísticos (Hidalgo y Maene, 2017), que han comenzado a rivalizar con los tradicionalmente atractivos para el turista internacional (Lee, 2015), y, por el lado de la demanda, con una identificación de flujos turísticos específicos que responden a motivaciones cada vez más diferenciadas, tales como los negocios, turismo congresual, interés cultural, turismo de naturaleza , etc. (Da Vita y Kyaw, 2016). Según los datos de la UNTWO (2018b), el número de turistas internacionales ha crecido a un ritmo del 3,9% entre 2005 y 2016, acentuándose al 4,5% en las economías emergentes. Además, se estima que al menos hasta el 2030, este ritmo creciente se mantendrá por encima del 3,3%, reafirmando un sector que genera un importante dinamismo económico, creación de empleo, inversión y desarrollo de infraestructuras (UNWTO, 2016) y que, además, se revela especialmente importante en países en desarrollo (Joshi et al., 2017). No podemos olvidar, tampoco, la importancia del efecto de arrastre que produce sobre otros sectores asociados, tales como la construcción, la agricultura, el transporte, las telecomunicaciones, entre otros.

El evidente desarrollo del turismo a nivel internacional, pero también de los flujos domésticos, contribuye a plantear el análisis de la competencia por parte de los destinos turísticos. Esto se manifiesta en el interés, tanto de estudiosos como de los agentes implicados, por determinar cuáles son los factores que ayudan a ganar espacio frente a sus rivales, a fin de atraer un mayor número de visitantes y, por ende, un nivel de ingresos mayor, lo que en términos generales contribuye al desarrollo económico y al bienestar y prosperidad de los destinos turísticos y las regiones donde se enclavan (Pulido-Fernández y Rodríguez-Díaz, 2016). Además, evidencia de esta rivalidad entre destinos, es el aumento del número de estudios que tratan de medir su competitividad en relación a otros destinos, tal y como alude Sainaghi et al. (2017).

Dentro de este proceso de expansión y diversificación del sector turístico, han surgido nuevas motivaciones que comienzan a tomar importancia frente al tradicional turismo de sol

y playa. Entre estas nuevas motivaciones destaca por su importancia, en volumen y especificidad, el turismo cultural. El deseo de consumir cultura es una de las motivaciones más antiguas para viajar. Como indican Noonan y Rizzo (2017), el origen del turista cultural puede encontrarse en los viajeros que recorrían Europa, ya en la segunda mitad del siglo XVI, realizando el denominado *Grand Tour*[1]. No obstante, este tipo de turismo se ha acentuado en las últimas décadas, tal y como muestran los datos. Según los resultados de la encuesta realizada por la Organización Mundial del Turismo (UNWTO, 2018a), el turismo cultural supone el 39.1% de los desplazamientos de turismo internacional, aumentando esta cifra si el mismo análisis se acomete sobre el flujo de turistas domésticos. En cuanto al ritmo de crecimiento, según esta misma fuente, es posible afirmar que el turismo cultural crece aún más rápido que el turismo general. Mientras que veíamos cómo el turismo sin discriminación por motivación, crece a un ritmo del 3.9%, el turismo cultural lo hace al 4,5%, entre 2010 y 2014. Esta progresiva importancia del turismo cultural ha contribuido a generar un especial interés por entender y analizar las características que lo determinan. Pero, ¿Qué entendemos por turismo cultural?

El turismo cultural es un concepto de uso generalizado pero que suscita cierta discusión conceptual, ya que en ciertas ocasiones se asimila al turismo en el que únicamente se realizan ciertos consumos culturales, dentro de viajes de motivación muy diferente. Este tipo de turismo de consumos diversos, entre los que puede incluirse con relativa importancia lo cultural, es el denominado "turismo omnívoro" por Barbieri y Mahoney (2010), ambos conceptos no deben confundirse. Existe un consenso bastante generalizado en considerar como cultural, al turismo suscitado por la existencia previa de una motivación estrictamente relacionada con la cultura. Partiendo de la definición aportada por Richards (1996) "*cualquier movimiento de personas hacia atracciones culturales, fuera de su lugar de residencia, con la intención de obtener experiencias para satisfacer sus necesidades culturales*", diferentes autores han puntualizado en qué consistiría esa motivación cultural. Puede ser *"una intención de aprender, experimentar, descubrir y consumir productos culturales"* (UNTWO, 2017), o bien *"*[interés por] *apreciar cualquier forma de actividad social, artística e intelectual"* (Barbieri y Mahoney, 2010). La definición de turismo cultural requiere una constante actualización, a medida que el propio concepto va englobando otros sectores, como la gastronomía, las industrias culturales, tradiciones, patrimonio inmaterial, etc.

Por lo tanto, el problema al respecto de todo análisis dentro de la disciplina del turismo cultural, viene dado por el hecho de que el único modo que tenemos de conocer la

[1]Inicialmente en el siglo XVI, pero con especial auge en el XVIII, los jóvenes aristócratas ingleses completaban su educación con un viaje de tiempo variable por Europa continental, a fin de conocer los principales hitos de su cultura. Para más información al respecto consultar Hudson (1993).

motivación de un turista pasa por una declaración explicita, generalmente obtenida mediante encuesta. Esto dificulta en gran medida la obtención de datos fiables. No obstante, no se puede obviar la evidente relación entre turismo y cultura, ambos se encuentran profundamente vinculados en la actualidad, en buena parte, debido al aumento de interés por la cultura como fuente de identidad local, frente a los procesos de globalización (Delgado, 2000).

Una de las maneras en las que más claramente se manifiesta la relación entre turismo y cultura, es el efecto determinante que la presencia de recursos culturales genera sobre el flujo turístico, tanto propiamente cultural, como general (Cracolici et al., 2008). Por esta razón resulta un desafío analítico interesante tratar de explicar ambos flujos, con respecto al efecto que sobre ellos generan los recursos culturales, algo que se ha tratado de realizar en esta tesis doctoral. Los recursos culturales tienen la capacidad de dotar de una identidad propia a los destinos, y por ello pueden considerarse como uno de los alicientes más importantes para motivar la llegada de turistas, cualquiera que sea su motivación. Por otro lado, el turismo cultural, bien sea especifico o de participación cultural de los turistas generales, tiene una gran importancia, puesto que genera un sector asociado muy considerable, en términos de volumen de actividad, y de carácter muy diverso, ya que involucra a otros muchos sectores asociados. Todo ello conlleva amplias implicaciones económicas y a su vez, contribuye al desarrollo local de forma significativa (Herrero, 2011b).

Habitualmente se parte de la hipótesis de que la acumulación de recursos culturales genera el contexto propicio para atraer un mayor número de turistas. Si bien, no todos los planteamientos parten de este efecto positivo. Riganti y Nijkamp, (2008) aluden al hecho de que muchos destinos turísticos, principalmente los más consolidados como Roma, Paris, Venecia, etc., atraen un volumen tal de turistas, que generan una alta congestión, perjudicial para la sostenibilidad turística de ese área. La congestión se relaciona con una mala experiencia por parte del turista y puede conllevar un impacto turístico menor. Por su parte, Cuccia et al. (2016), cuantifican el efecto negativo que supone la acumulación de declaraciones UNESCO sobre el turismo en Italia, de nuevo en términos de congestión que los visitantes tratan de evitar, y que conlleva gestiones no eficientes. En nuestra investigación doctoral hemos podido comprobar ambos efectos: en términos generales una contribución positiva del patrimonio cultural a la atracción del turismo; Pero, en determinados casos, como en el análisis del flujo turístico de motivación cultural en España, hemos cuantificado los efectos potencialmente perniciosos de la congestión turística.

3. Metodología: Modelos de evaluación de la eficiencia y la competitividad turística.

En los últimos años se ha desarrollado un interés creciente por la medición del rendimiento y la competitividad del sector turístico, tal y como recoge Sainaghi et al. (2017). La medición del desempeño turístico se plantea en base a diferentes metodologías, aportando con sus resultados interesantes utilidades prácticas para los gestores turísticos. Sin embargo, la búsqueda de la medida más adecuada para cuantificar este rendimiento es aún motivo de debate, no existiendo una tendencia común generalizada (Sainaghi, 2010). Por ello, el concepto de medición del desempeño turístico aúna en la actualidad un gran número de perspectivas metodológicas, si bien el principal foco se encuentra en la perspectiva que ofrece el análisis de evaluación de la eficiencia en la industria turística y de los destinos turísticos (Tsionas y Assaf, 2014). No obstante, existen otras metodologías que desarrollan planteamientos complementarios o que lo abordan desde perspectivas diferentes, aludiendo a conceptos más cercanos a la competitividad, observando el efecto de factores externos, construyendo indicadores sintéticos, etc. A continuación procedemos a resumir los planteamientos metodológicos que se emplean en los diferentes estudios que conforman nuestra tesis doctoral, y que se insertan en el ámbito de la discusión científica y avances analíticos del área de estudio de evaluación de la eficiencia y la competitividad turística.

3.1. Métodos de frontera: el Análisis Envolvente de Datos

La medición de la eficiencia se basa en la idea de comparar un plan productivo con un óptimo o mejores prácticas, por lo que es necesario establecer este punto de referencia. Es por ello que la eficiencia se puede cuantificar como una distancia relativa con respecto de una frontera, que representa ese límite máximo de eficiencia entre los casos analizados. De forma general, son dos los procedimientos que permiten cuantificar dicha frontera: los modelos paramétricos y no paramétricos. En los métodos paramétricos es necesario establecer previamente la forma funcional de la frontera, estimando posteriormente sus parámetros por medio de técnicas econométricas como la máxima verosimilitud. Como señala Fernández (2013) su principal ventaja es que satisface la propiedad esencial de las fronteras estocásticas. Cuando una unidad se ubica fuera de la frontera, podemos distinguir en qué medida esa situación se debe a su ineficiencia, o a condicionamientos externos. Por el contrario la metodología no paramétrica no impone una estructura previa determinada a la forma funcional y por lo tanto se considera más flexible, ya que son los propios datos considerados los que definen el perfil de la frontera mediante una función envolvente. Sin embargo, y frente a la aproximación paramétrica, este tipo de planteamientos, entre los que

destaca el Análisis Envolvente de Datos, considera cualquier desviación con respecto de la frontera como una ineficiencia (Álvarez, 2001), aunque puede no ser del todo cierto, de modo que resulta conveniente complementar este análisis, con estudios de incidencia de factores externos (Fernández et al. 2013). Debido a que el DEA es la metodología que sostiene buena parte de nuestra aplicación empírica, vamos a acometer su análisis de forma más profunda a continuación.

Como hemos dicho anteriormente, el DEA es una metodología no paramétrica de programación matemática que nos permite analizar la eficiencia técnica[2] de los destinos turísticos, en relación a su capacidad de atracción del flujo turístico o competitividad. Esta metodología no se limita a sintetizar los factores turísticos de atracción, sino que se centra en el proceso productivo en relación a su estrategia de gestión. En términos de los autores Coll y Blasco (2006) el DEA es:

> *"una técnica de programación matemática que permite la construcción de una frontera eficiente a partir de un conjunto de unidades objeto de estudio, de forma que las unidades que determinan la envolvente son denominadas unidades eficientes y aquellas que no permanecen sobre la misma son consideradas ineficientes".*

El DEA es inicialmente desarrollado por Charnes et al. (1978) partiendo de los preceptos básicos anteriormente expuestos por Farrell (1957). Conceptualmente es una metodología de frontera no paramétrica, empleada para evaluar el nivel de eficiencia dentro de un grupo de unidades, por medio del cálculo de una envolvente con las unidades que presentan unas mejores prácticas y sus combinaciones lineales. Por lo tanto, las unidades que quedan por debajo de esta frontera serán las consideradas como no eficientes.

Concretamente el DEA considera el proceso productivo por el cual una unidad de toma de decisión combina sus recursos, para generar o maximizar su output. Se hace necesario, por lo tanto, la construcción de una función de producción, en la que se incluyen todos los factores productivos y los productos generados de la combinación de los primeros.

Como toda metodología, posee una serie de ventajas y desventajas que es interesante tener en cuenta, y que se tratan de sintetizar en la Tabla 2.

[2] Entendemos por eficiencia técnica la relación óptima entre recursos y producción. Es decir, un proceso productivo en el que la entidad no "malgasta" recursos. Para más detalle al respecto de esta definición, consultar el trabajo de Álvarez (2001).

Tabla 2. Síntesis de las características del modelo de Análisis Envolvente de Datos

Ventajas	Desventajas
Debido a que es una metodología no paramétrica, no son necesarios apriorismos sobre la forma funcional y la relación existente entre inputs y outputs, muy útil en contextos en los que se desconoce la importancia de cada uno de ellos en el proceso de producción. Es el propio procedimiento el que, en base a los datos, estima la forma funcional, resolviendo un simple problema de optimización (Raju y Kumar, 2006).	Es una aproximación de carácter determinístico, no estocástica. Por ello considera toda distancia con la frontera como ineficiencia y no tiene en cuenta la incertidumbre que puede influir en el proceso productivo (Fuentes, 2000). Esto puede solucionarse por medio de la aplicación de modelos complementarios, como la eficiencia condicionada en dos etapas, en los que se incorpora el efecto de variables externas.
Aplicable dentro de contextos con ausencia de precios de las variables de la función de producción, es decir en modelos de no mercado (Álvarez, 2001).	El modelo requiere que las unidades que van a ser comparadas muestren una cierta homogeneidad entre sí, tanto en su contexto como en sus variables (Dyson et al., 2001).
Aplicable dentro de modelos de producción multioutput (Fuentes, 2000).	Subjetividad a la hora de definir la función de producción, ya que es el propio investigador quien de forma escrupulosa debe definirla. La consecuencia de la omisión de variables relevantes son estimaciones sesgadas (Morala, 1992).
Permite la introducción de variables con diferentes unidades de medida, que no afectan a las estimaciones (Dyson et al., 2001).	Requiere de un tamaño muestral suficiente y en proporción al número de inputs y outputs considerado, en caso contrario se producirá una distorsión sobre la eficiencia, que se verá erróneamente sobreestimada (Dyson et al., 2001).
Los pesos estimados son endógenos determinados por el programa de optimización. Sin embargo, permite la introducción de restricciones que ofrecen estimaciones más fiables. (Peiró-Palomino y Picazo-Tadeo, 2018)	Sensibilidad al signo de las variables. No pueden introducirse variables con signo negativo, ya que originaría unas estimaciones erróneas. Son por lo tanto necesarias transformaciones y ajustes previos (Avellón, 2015).
Se obtiene un nivel de resultados muy completo. Además de los propios resultados de la eficiencia, obtenemos las ponderaciones que optimizan el proceso para cada unidad, los grupos de referencia de las DMUs ineficientes, su margen (calculado como la distancia hasta el óptimo) y sus pautas de mejora según mejoras potenciales, mediante la expansión de los niveles de resultado o la reducción de los recursos (Avellón, 2015).	Sensibilidad a la presencia de datos atípicos. La principal consecuencia seria las sobreestimación de los resultados. La principal solución que puede aplicarse consiste en aplicar datos temporales y trabajar con resultados medios. Así como el modelo de Windows Analysis (Charnes et al. 1985). De igual modo resulta sensible a los datos perdidos dentro de las variables, que ocasionan distorsiones en los resultados
El resultado obtenido es un indicador sintético de la eficiencia relativa de las unidades productivas evaluadas (Álvarez, 2001).	La libertad en los pesos, que se considera como una ventaja, puede resultar excesiva en ocasiones, generando resultados poco fiables y sobreestimados, ya que puede otorgar pesos nulos a determinadas variables a lo largo del proceso de optimización (Murias et al. 2006). Esto puede darse solución por medio de la introducción de restricciones a los pesos.

Fuente: Elaboración propia

El DEA aplicado a la medición de la eficiencia de los destinos turísticos se fundamenta en el diseño de una función de producción virtual, que en nuestro caso responde a la gestión de entidades territoriales, donde se recogen sus recursos o inputs, que al combinarse generan una serie de outputs o resultados. Esto implica que, desde el punto de vista hipotético, según nuestra definición del objeto de estudio, los destinos son capaces de manejar sus recursos turísticos para maximizar su output, que será el marcador de la eficiencia elegido, y que bajo

nuestro planteamiento se relaciona con el flujo de turismo. En base a todo ello, a continuación, presentamos la formulación básica del DEA, que consiste en un problema de optimización:

$$max_{\theta,\lambda}\ \lambda$$

$$st\ \ \lambda\, y_{im}\ \leq\ \sum_{k=1}^{C} \gamma_k\, y_{mk},\quad m = 1 \ldots, M,$$

$$\sum_{k=1}^{C} \gamma_j\, x_{kn}\ \leq\ x_{in},\quad n = 1 \ldots, N, \qquad [1]$$

$$\gamma_i\ \geq 0, i, k = 1 \ldots, C$$

donde C sería el número de destinos que componen la muestra, $x \in \mathbb{R}_+^N$, $y \in R_+^N$ son los vectores de inputs y output correspondientes al destino i, γ es un vector de pesos C × 1, y λ es un escalar. Teniendo en cuenta que λ tomará un valor mayor o igual que 1, y que λ-1 es el aumento proporcional del output que podría alcanzar el i-ésimo destino, con las cantidades de inputs constantes. El valor $1/\lambda$ es el resultado de la eficiencia técnica que varía entre 0 y 1. La fórmula anterior se resuelve C veces, una vez para cada unidad de análisis.

Una de las principales cuestiones a tener en cuenta a la hora de plantear un modelo DEA, es definir su orientación, de cuya decisión dependerá la forma de optimización del modelo. Consiste en determinar cómo se va a medir la distancia respecto de la frontera productiva, ya sea con una orientación al input, es decir en dirección a la economización de los recursos dado un nivel de resultado; o bien con una orientación al output, donde la búsqueda de la eficiencia se plantea encontrando las ponderaciones que van a maximizar el resultado dada una cantidad de inputs. Existe una tercera opción, el modelo no orientado, en este modelo se busca simultáneamente la reducción del input y la expansión del output, de forma equiproporcional, sin embargo es un modelo menos empleado.

La decisión sobre la orientación del modelo se debe argumentar según diferentes cuestiones, tal y como indica Ramanathan (2003), por un lado, con respecto a los rendimientos a escala considerados, según la decisión que a este respecto se tome los resultados serán diferentes, salvo en el caso de considerar rendimientos a escala contantes, cuando la orientación no influye sobre los resultados (Färe y Lovell, 1978). Por otro lado se debe considerar la propia política del sector y sus objetivos. En la mayor parte de los estudios dentro del sector turístico se tiende a la maximización del output, puesto que se acomoda mejor al planteamiento práctico (Assaf y Cvelbar, 2010; Assaf y Agbola, 2011). Lo que los destinos pretenden es, dados sus recursos, maximizar la llegada de turistas, que es lo que finalmente genera el impacto económico y desarrollo local, objetivos últimos que se desean alcanzar.

Además es necesario considerar posibles casos de procesos productivos en los que, o bien los inputs y los outputs puedan estar establecidos previamente, o bien se parte de procesos en los que no se cuenta con total operatividad sobre los inputs, en cuyo caso se debe optar por el modelo de maximización del output (Fuentes, 2000).

Por otro lado, es igualmente necesario tomar una decisión en cuanto a la hipótesis tecnológica, es decir, el tipo de rendimientos a escala que van a considerarse para el diseño de la frontera de producción, asumiendo que la medida de la eficiencia de una unidad puede estar condicionada por la escala en la que esta opera. Se pueden definir, por lo tanto, rendimientos a escala constantes (CRS) (Charnes, et al., 1978), que técnicamente implica que el modelo incluye una restricción sobre los coeficientes de ponderación del modelo, impidiendo que estos superen la unidad. Según esta hipótesis las unidades consideradas no están sometidas a diferencias entre escalas operativas. Este es el modelo más empleado en el análisis de eficiencia de los destinos turísticos (Soysal-Kurt, 2017), especialmente en aquellos que incluyen un análisis de segunda etapa (Barros et al. 2011), dado que su objetivo principal no consiste en investigar las ineficiencias de escala, sino buscar posibles determinantes de las variaciones de la eficiencia. Motivos por los que, como se podrá ver, será la metodología que apliquemos en la mayor parte de nuestros planteamientos empíricos. Además el modelo CRS, al ser más restrictivo, genera un indicador de eficiencia con una mayor variabilidad y menos unidades sobre la frontera, y además logra cuantificar la eficiencia técnica en sentido global.

Sin embargo, el CRS es un modelo restrictivo, y por ello es necesario tener en cuenta que puede generar errores en las estimaciones, definiendo como no eficientes unidades debido a problemas de escala, y no a comportamientos subóptimos. Por ello, Banker, et al. (1984) desarrollan el modelo de rendimientos a escala variables (VRS), eliminando la restricción sobre los coeficientes anteriormente señalada. Este modelo se debe emplear en supuestos en los que el objetivo es medir la eficiencia técnica pura y cuando existe la certeza de que las diferencias de escala entre las DMUs pueden condicionar los resultados (Assaf y Josiassen, 2012).

Este es el planteamiento básico del DEA, sin embargo, para mejorar las propiedades de sus resultados, es posible aplicar un procedimiento de bootstrap. Inicialmente propuesto por Simar y Wilson (1998) -y mejorado en la flexibilidad de su planteamiento por Simar y Wilson (2000)- en relación a la inferencia del DEA, y en base a lo propuesto por Efron (1979). Estas mejoras se desarrollan ya que se considera que los estimadores fruto de la aplicación de modelos paramétricos sufren la maldición de la dimensionalidad (Benito et al 2014), es

decir, que la tasa de convergencia disminuye cuando aumenta la dimensión del conjunto alcanzable. La incorporación del bootstrap permite calcular el sesgo y la varianza, y por lo tanto crear unos intervalos, que dotan de mayor consistencia a los resultados. Autores como Barros et al. (2011), proponen aplicar un bootstrap con al menos 2.000 iteraciones. En nuestra investigación hemos aplicado este tipo de correcciones en diferentes versiones adaptadas al diseño metodológico de cada caso de estudio.

3.2. Modelos de eficiencia condicionada en dos etapas:

Frente al análisis del rendimiento turístico por medio del DEA, en los últimos años ha comenzado a ser especialmente habitual el empleo de modelos de evaluación de eficiencia en dos etapas (Assaf y Josiassen, 2012). Uno de los principales motivos de su popularización se basa en su capacidad para abordar, no solo la eficiencia en la gestión, en este caso de los destinos turísticos, sino considerar el efecto que sobre ésta ejercen factores ambientales o externos, lo que en una función estrictamente gerencial para una institución pudieran ser los factores no discrecionales, es decir, variables no controlables por el gestor.

El modelo consiste en, primeramente, calcular los ratios de eficiencia por medio del modelo DEA, en base a lo expuesto en el epígrafe anterior. Posteriormente, se introduce el índice resultante como variable dependiente en un análisis de regresión, incluyendo como variables independientes diferentes factores exógenos o ambientales. Se trata de factores externos que no forman parte del proceso productivo en sí mismo, pero que sí pueden determinarlo. En este sentido, y en el contexto de la evaluación de los destinos turísticos, es especialmente habitual incluir variables relacionadas con la accesibilidad, la infraestructura y dotaciones en servicios turísticos, los recursos culturales y naturales, o incluso factores climáticos o de seguridad. Con esta aplicación podremos concluir qué variables condicionan la eficiencia de los destinos, en qué medida lo hacen y si el efecto contribuye a generar el entorno propicio para la eficiencia, o si por el contrario generan unas condiciones adversas. El modelo de regresión que conforma la segunda etapa responde por lo tanto al siguiente planteamiento:

$$\theta_k = \beta\, x_k + \varepsilon_k \qquad [2]$$

donde $\varepsilon_k \sim N(0, \sigma^2)$, y β es un vector de parámetros para la serie de variables independientes x_k .

En cuanto a las ventajas y desventajas que ofrece la aplicación de esta técnica, en primer lugar indicar que al incorporar el modelo DEA, asume sus principales fortalezas e inconvenientes, a los que se suman como ventajas, su capacidad para incorporar un mayor

número de variables al modelo sin perder capacidad explicativa. Además ofrece solución al carácter determinístico del DEA, pudiendo explicar posibles comportamientos no eficientes, que no se deben a comportamientos subóptimos, si no a las propias características determinísticas del modelo. Sin embargo, como principales inconvenientes que se atribuyen son los sesgos que posee en sus estimaciones. Por un lado el análisis de la incidencia de los factores ambientales por medio de modelos de regresión tradicionales, no son válidos. Esto es debido a que no dan solución a la correlación que existe entre los resultados de la eficiencia de cada una de las DMUs. Esta correlación se basa en que el cálculo de la eficiencia de una unidad incorpora información de las otras observaciones de la muestra, por el propio método de cálculo (Assaf y Agbola, 2011). Por otro la existencia de una importante correlación entre el termino de error de las variables que conforman la función de producción y las variables de entorno, especialmente significativa en muestras reducidas, lo cual viola el principio básico de independencia de las variables explicativas en el modelo de regresión. (Jebali et al. 2017)

Por estos sesgos presentes en el proceso de estimación de la segunda etapa, modelos de regresión como el Mínimos Cuadrados Ordinarios no son válidos, y por ello se aplican otras aproximaciones que tratan de minimizarlos, como el modelo truncado Tobit, desarrollado por Tobin (1958), y generalizado en los modelos de evaluación de eficiencia condicionada de los destinos turísticos (Wang et al. 2006 y Shang et al 2010). A estas mejoras se suma el modelo estadísticamente más refinado, desarrollado por Simar y Wilson (2007), en base a su algoritmo número 2, con un procedimiento de doble bootstrap, agregando a las réplicas generadas para los resultados del DEA, un proceso de iteraciones en el análisis de regresión. Con ello se logra obtener estimaciones insesgadas y más consistentes de los parámetros, por medio del cálculo de intervalos de confianza para los coeficientes de la regresión (Barros et al. 2011). Por lo tanto, el modelo pasa a estar fundamentado en una aplicación de máxima verosimilitud a fin de obtener un $\hat{\beta}$ para β y un $\hat{\sigma}_\varepsilon$ para $\sigma_\varepsilon$en la regresión truncada de $\hat{\theta}_k$ en x_k usando la submuestra de DMUs no eficientes, es decir con resultados por debajo de 100. Posteriormente se realiza el cálculo de las estimaciones de L bootstrap para β y σ_ε de la siguiente manera:

- Para cada país ineficiente, se dibuja ε_k de una distribución normal con varianza $\hat{\sigma}_3^2$ y truncamiento izquierdo en $1 - \hat{\beta}x_k$ y se calcula $\theta^* = \hat{\beta}x_k + \varepsilon_k$
- Posteriormente se estima la regresión de θ_k^* en x_k por medio de máxima verosimilitud, generando una estimación bootstrap $(\hat{\beta}^*, \hat{\sigma}_\varepsilon^*)$.

Por último, se realizan las repeticiones bootstrap planteadas, que según la mayoría de los trabajos deben ser al menos 5.000 (Jebali, et al. 2017), que permiten construir intervalos de confianza para β y σ_{ε}.

Por lo tanto, con esta aplicación del Algoritmo número 2 de Simar y Wilson (2007), podemos considerar que los resultados evitan los principales sesgos que se le atribuyen al modelo de eficiencia condicionada en dos etapas. Su consistencia estadística, su capacidad para incorporar al análisis tanto el proceso productivo de gestión turística, como el posible efecto condicionante de factores externos, lo convierte en una metodología especialmente adecuada para medir la eficiencia turística desde un punto de vista amplio, y por ello se está consolidando en los últimos años como una metodologías ampliamente empleada en este ámbito (Sainaghi, et al. 2017).

3.3. Construcción de indicadores sintéticos de competitividad turística

De forma paralela al empleo de modelos de frontera y de análisis de segunda etapa para cuantificar la competitividad de los destinos turísticos, se ha desarrollado una importante literatura basada en el empleo de indicadores sintéticos de competitividad turística (Mendola y Volo, 2017). Un indicador sintético es la compilación de indicadores simples en un único índice sobre la base de un modelo teórico subyacente. Su principal función consiste en sintetizar conceptos multidimensionales, que no pueden ser capturados por una sola variable. Además, los indicadores sintéticos constituyen una herramienta muy utilizada en el campo de la economía aplicada, y empiezan a aplicarse frecuentemente en el ámbito de la economía de la cultura (Srakar et al., 2018), en parte por el gran atractivo de su utilidad, ya que permite la síntesis de conceptos y son de fácil interpretación, aunque también están sometidos a críticas, referidas a ciertos fallos y abusos en la confección y la extensión simplista de su interpretación (OECD, 2008).

Las metodologías que permiten construir indicadores sintéticos son múltiples. Por un lado se han desarrollado los indicadores compuestos en base a modelos no ponderados, como el que aplica en el análisis de la competitividad turística el WEF (2017) sin embargo estos suelen presentar ciertas deficiencias que tratan de solventarse introduciendo un esquema de pesos. Emtre ellos aquellos que se sustentan en el análisis estadístico multivariante, y que van desde el tradicional uso de suma de factores ponderados por su varianza, hasta los nuevos planteamientos como el desarrollado por Nicoletti et al. (1999), donde se emplea pesos basados en el cuadrado de las saturaciones normalizadas. Por otro lado, existen metodologías que se basan en pesos exógenos, que pueden ser generados por medio de opiniones de expertos, o bien en base a metodologías y supuestos ad hoc, como los modelos

Delphi (Linstone et al. 2002) o modelos de Analyric Hierathic Pocess (Saaty, 1980), modelos que extraen los pesos de los coeficientes resultantes de análisis de regresión (Croes y Kubickova, 2013), o modelos que de igual modo tratan de ser objetivos en la obtención de los pesos como el Neural Network Analysis (Lan et al. 2012). Por otra parte, en la actualidad está cobrando especial importancia el uso de la técnica Data Envelopment Analysis (DEA) para la construcción de indicadores compuestos. Su aplicabilidad radica en que puede conseguir una combinación ideal de outputs para una definición unitaria de inputs, y por tanto se pueden optimizar funciones multioutput compuestas por los diferentes indicadores simples que queremos sintetizar (Murias et al., 2006). La ventaja que otorga la aplicación del DEA frente a otras metodologías consiste en que caben multitud de opciones de ponderaciones en el problema de optimización (ponderaciones naturales según enfoque denominado "beneficio de la duda" o acotaciones específicas según criterios justificados).

En todo caso, su capacidad de sintetizar múltiples variables en una sola, sitúa al modelo de construcción de indicadores sintéticos como una metodología especialmente adecuada para medir la competitividad de los destinos turísticos, debido a la facilidad con la que los resultados pueden interpretarse, dando lugar a rankings que permiten, en el caso de análisis de la competitividad, comparar unas unidades con otros de forma muy sencilla y directa. Además permiten sintetizar una cantidad de información muy importante respecto a atractivos turísticos, no perdiendo capacidad explicativa. Sin embargo, como desventajas, en primer lugar, para el caso del análisis de la competitividad, la construcción de indicadores sintéticos no nos permite observar el proceso productivo, se limita a analizar la oferta que los destinos turísticos poseen. Además, la necesidad de tomar decisiones en relación al modo de atribuir los pesos, que puede generar problemas en los cálculos, dando lugar a resultados sobreestimados o infraestimados. Y por último, el nivel de resultados obtenidos es menos rico, puesto que permite focalizar debilidades y generar rankings, pero no nos ofrece información relevante del margen de mejora, unidades de referencia, etc. (Martín et al. 2017)

Buena parte de estas críticas pueden solventarse por medio del empleo del modelo de Análisis Envolvente de Datos para la construcción de indicadores sintéticos, en base a su orientación "Beneficio de la Duda" (BoD). Aunque la aplicación del DEA se limitó inicialmente al análisis de procesos productivos, la técnica se ha utilizado posteriormente en otros contextos, particularmente para la construcción de indicadores compuestos. Basado en la propuesta inicial desarrollada por los autores Melyn y Moesen (1991) y Lovell et al. (1995) y adaptado posteriormente por autores como Cherchye, et al. (2004) y Murias et al. (2012). Esta trasformación de la formula clásica del DEA, para adaptarse a la construcción de indicadores compuestos, consiste en considerar un único input, de valor unitario para todas

las unidades, y sustituir los outputs por los factores o indicadores parciales que deseen sintetizarse, por lo que el resultado corresponderá con la mejor combinación lineal posible de outputs.

La ventaja que otorga la aplicación del DEA, frente a otras metodologías, consiste en que no requiere incluir ponderaciones previas, las ponderaciones son naturales y provienen de la intensidad de los propios datos, con el objetivo de conseguir la mejor combinación. Es decir, en los factores que una cierta DMU opera con malos resultados, esta variable contribuirá con un peso bajo a la construcción del indicador compuesto, y por el contrario, en las variables que tenga un resultado adecuado, tendrán un peso mayor. Esto favorece la objetividad del proceso ya que no se establecen apriorismos (Murias et al. 2008).

Debido a todas las ventajas que se han presentado, puede considerarse un modelo adecuado para la construcción de indicadores, sin embargo presenta dos importantes desventajas, que deben ser tenidas en consideración. En primer lugar, es necesario considerar que si el número de variables que van a ser aglutinadas en el indicador compuesto es alto respecto al número de DMUs, el modelo puede perder capacidad de discriminación, ubicando sobre la frontera de eficiencia a un número muy elevado de unidades, por lo que realizan rankings resulta inviable, perdiendo una de sus principales aplicabilidades. Además, debido a que en nuestro caso vamos a medir la competitividad en términos relativos, es decir, comparando unas unidades con otras, y dado que para cada unidad se ha operado con un esquema de pesos diferentes, las comparaciones pueden no ser válidas.

En base a las señaladas desventajas que posee el DEA-BoD, es habitual la corrección de los resultados por medio de metodologías como el Multi-Criteria Decision Making (MCDM), inicialmente planteado por Despotis (2002 y 2005), y tal y como desarrollan autores como, Bernini et al. (2013) y Guardiola y Picazo-Tadeo (2014). Básicamente, este planteamiento consiste en emplear técnicas de toma de decisión multicriterio, para establecer ponderaciones comunes entre las unidades que conforman nuestra muestra, pero siempre partiendo de las obtenidas con el DEA, y tratando de minimizar la distancia respecto a ellas. Por otro parte, este modelo combinado permite establecer rankings, debido a que consigue "desempatar" en gran medida las unidades que eran ubicadas en la frontera de eficiencia por el DEA, y como parte de su pérdida de capacidad de discriminación de resultados. En base a ello el planteamiento de esta metodología seria la siguiente:

Minimizar $_{m_d,\, w_v,\, h}$ $t\frac{1}{D}\sum_{d=1}^{D} m_d + (1-t)h$

Sujeto a:

$\sum_{v=1}^{V} w_v$ Variable $v_d + m_d = \mathrm{CI}^{*}_{d}$ $\qquad d = 1,\ldots,D$

$$(m_d - h) \leq 0 \qquad d = 1,\ldots,D$$
$$m_d \geq 0 \qquad d = 1,\ldots,D$$
$$w_v \geq \varepsilon \qquad v = 1,\ldots,V$$
$$h \geq 0 \qquad [3]$$

donde CI^*_d representa el indicador resultado del DEA; w_v representa el peso común asignado a la variable *v*; ε es un número bajo no-*arquimediano* que asegura que todas las dimensiones de la competitividad tienen un peso positivo en el cálculo del indicador compuesto; *h* es un parámetro no negativo a estimar; m_d representa la desviación entre el indicador compuesto de la competitividad del destino *d* calculado con DEA —y pesos idiosincráticos— y el indicador calculado con MCDM y pesos comunes; y, finalmente, *t* es un parámetro que va desde 0 a 1 que debe ser resuelto previamente por el investigador y permite planteamientos teóricos alternativos

Además con el objetivo de medir la competitividad de los destinos turísticos, el resultado del cálculo de este indicador sintético, puede incorporarse dentro de un análisis de regresión, a fin de observar el efecto de otro tipo de variables ambientales, y que en base a lo anteriormente expuesto en los epígrafes previos, debe ser implementado por medio de la metodología planteada por Simar y Wilson (2007)

4. La eficiencia de los destinos turísticos: *estado del arte*

A lo largo de los últimos años se han planteado múltiples aproximaciones para la medición de la eficiencia del sector turístico, con enfoques muy variados que ofrecen diversas perspectivas y que se acometen en base a diferentes aproximaciones metodológicas. Un buen acercamiento para conocer este fecundo ámbito de estudio es el trabajo bibliométrico de Sainaghi et al. (2017), donde se revisa un representativo número de trabajos realizados en los últimos 20 años, relacionados con la eficiencia de la gestión turística desde un punto de vista amplio, y en particular la evolución de la competitividad de los destinos turísticos.

Como se ha señalado, el análisis de eficiencia del sector turístico se puede plantear con un variado número de metodologías y enfoques, sin embargo, resulta especialmente interesante clasificar los estudios en base a su objeto de estudio, que condiciona el planteamiento general del trabajo. Por un lado, contamos en primer lugar con los estudios que centran su análisis en el ámbito de la industria turística, analizando diferentes agentes que conforman el entramado empresarial, principalmente privado, de gestión turística, pero que por el hecho de estar ubicados en el territorio, tienen en parte un componente de análisis espacial. Son el grupo de estudios más abundante, pues como veremos a continuación, parten de

planteamientos concretos y reales de producción, y además poseen una aplicabilidad clara. Por otro lado, en los últimos años ha comenzado a consolidarse una línea de trabajo que se centra en la evaluación de los destinos turísticos, entendidos como unidades territoriales. Estos parten de un planteamiento de función de producción hipotética y virtual, y que se basa en el supuesto de considerar que los destinos tienen operatividad sobre sus recursos y atractivos a fin de maximizar su output turístico entendido en términos de visitantes o en términos generales de flujo económico. A continuación, vamos a referenciar algunos de los principales trabajos que aplican los planteamientos expuestos.

En el primero de los casos, los estudios que analizan la eficiencia dentro del ámbito de la industria del turismo, se parte de una función de producción real, pues se evalúan compañías y agentes que poseen una serie de recursos, en forma de capital y trabajo, y generan una serie de outputs, en buena parte relacionados con su rendimiento económico. Por lo tanto, se basa en un planteamiento de un sistema productivo tradicional, en el que es relativamente sencillo analizar la eficiencia en la gestión. En esta línea han trabajado diferentes autores en base a prototipos de intermediarios turísticos, como pueden ser las agencias y los operadores turísticos, que han sido analizados según una aproximación de corte paramétrico por Barros y Matías (2006), dentro del contexto portugués. Especialmente abundantes son las aplicaciones por medio de la metodología DEA, como el desarrollado por Wöber (2006), quien analiza una muestra de touroperadores en Austria, Köksal y Aksu (2007), quienes hacen lo propio para una muestra de 24 agencias turísticas en Turquía, contrastando las posibles diferencias de eficiencia entre las agencias independientes y las que pertenecen a cadenas, y por último el trabajo de Fuentes (2011), quien analiza la eficiencia de las agencias turísticas de Alicante (España), observando además el efecto de variables externas sobre la eficiencia. Otra unidad de análisis dentro de la industria turística son las relacionadas con la hostelería, como los llevados a cabo por Giménez-García et al. (2007) y Reynolds y Thompson (2007), el primero en una muestra de restaurantes de comida rápida en España, y el segundo en una cadena de restaurantes de los Estados Unidos ambos por medio del DEA.

Sin embargo, la unidad turística empresarial que protagoniza un mayor número de trabajos son los hoteles y cadenas hoteleras. Dentro de este marco de estudio se encuentran los trabajos de Barros (2004 y 2005), ambos en base a modelos paramétricos en el contexto Portugués, aportando como novedad en el segundo la cuantificación del progreso tecnológico. Empleando esta misma metodología trabajan Bernini y Guizzardi (2010) y Arbelo et al. (2016), para una muestra de hoteles de Italia y España, respectivamente. Mientras que Assaf y Magnini (2012), desarrollando igualmente un modelo estocástico, aportan un planteamiento novedoso en el contexto de las cadenas hoteleras de Estados

Unidos, incluyendo un output cualitativo en el análisis, la satisfacción del consumidor. En el caso de aplicaciones de eficiencia por medio de DEA, dentro del contexto de los hoteles, contamos con ejemplos como el de Sigala (2004), quien aplica el modelo de DEA-Stepwise para los hoteles de Reino Unido. Por su parte Barros (2005) analiza la red de alojamientos de titularidad nacional portuguesas, Las Pousadas, mientras que Pulina et al. (2010) aplican la metodología del Windows-DEA para analizar la eficiencia en una muestra de hoteles en Italia. Perrigot et al. (2009) y Assaf y Cvelbar (2010), realizan un estudio de eficiencia técnica con características similares, en este caso en el sector hotelero de Francia y Eslovenia respectivamente. Abandonando el ámbito occidental contamos con un número significativo de trabajos ubicados en el continente asiático, como el de Keh et al. (2006), quienes observan la eficiencia de una cadena hotelera de Asia Pacifico, con especial atención a la gestión del marketing, por medio de un Windows-DEA. Untong et al. (2011), aplica un modelo de eficiencia técnica en hoteles de Thailandia, considerando el cálculo del progreso técnico por medio de los índices de Malmquist, mientras que Wang et al. (2006) y Shang et al. (2010) aplican sendos estudios con la metodología de eficiencia condicionada en dos etapas, ambos en el contexto de Taiwán. Honma y Hu (2012) realizan un análisis de eficiencia doble, contrastando los resultados de la aplicación del modelo de frontera estocástica y del DEA, para una muestra de hoteles en Japón, y Oukil et al. (2016) plantea un trabajo de nuevo por medio del modelo de eficiencia condicionada en dos etapas, para una muestra de hoteles en este caso de Omán. Por último, aumentando la escala hasta el nivel mundial, señalar el análisis de Mendieta-Peñalver et al. (2018), donde se realiza un análisis sobre una muestra de cadenas hoteleras a escala internacional, diferenciando entre el cálculo de la eficiencia técnica, eficiencia de escala y eficiencia global.

En cuanto a los trabajos que toman por objeto de estudio la evaluación de los destinos turísticos, ámbito en el que se enmarca nuestra tesis doctoral, en primer lugar, apuntar que el número de trabajos es sensiblemente inferior, y en líneas generales más recientes. Esto puede justificarse debido a su mayor complejidad, ya que parten de un planteamiento hipotético, en el que es necesario el diseño de una función de producción virtual para unidades territoriales. Esta función de producción está basada en el supuesto de que los destinos poseen una supuesta operatividad sobre sus recursos, a fin de optimizar su resultado turístico, en base al output que se defina, y que generalmente está relacionado con la demanda turística. Este planteamiento se basa en el concepto de competitividad territorial, desarrollado por Crouch y Ritchie (1999). Sin embargo, es importante puntualizar que aun siendo un proceso productivo virtual, como afirma Soysal-Kurt (2017) es posible analizar el destino turístico como un negocio comercial o como una industria territorial (Cracolici, et al., 2008), en base a un modelo clásico de eficiencia. De forma sintética, esto consiste en evaluar

la relación o ratio entre los inputs sobre los que se entiende que el destino tiene cierta operatividad (básicamente recursos y dotaciones turísticas), y los outputs turísticos que el destino genera, medidos en términos de flujo turístico o impacto económico generado (Hadad et al. 2012).

Dentro de los estudios que abordan este tipo de análisis, podemos establecer diferencias en base a la escala de la unidad de análisis. Por un lado tenemos aquellos que plantean un estudio de escala regional, dentro de los cuales podemos distinguir entre aquellos que basan su investigación en una función de producción de ajuste estrictamente gerencial, en la que se relacionan recursos propiamente turisticos como la capacidad de alojamiento, el factor trabajo, las llegadas de turistas, etc., que se combinan para maximizar el número de pernoctaciones, como principal output, lo que supone una aproximación básica de optimización del flujo turístico. Trabajan en esta línea Botti et al. (2009) y Barros et al. (2011) en el contexto del sector turístico francés, ambos en base a la metodología DEA, además del realizado por Benito et al. (2014), para las 17 regiones Españolas, quien aplica la metodología de eficiencia condicionada en dos etapas y prestando especial atención al análisis de los determinantes externos de la eficiencia. Y Cuccia et al. (2016), quienes aplican un modelo de DEA con doble bootstrap, para analizar la eficiencia de las regiones italianas en la atracción de flujo turístico.

Frente a estos trabajos, existen otras contribuciones que se centran en construir una función de producción de escala regional más sofisticada. En ellas se incluyen como inputs algunas de las variables que los trabajos anteriormente mencionados consideran como factores externos. Su planteamiento consiste en incorporar al proceso productivo como inputs, los principales recursos culturales disponibles en el destino (patrimonio artístico, instituciones culturales, festivales, etc.) así como el factor trabajo relativo al propio sector turístico. Mientras que como resultado se considera el flujo turístico, entendido como output a optimizar. Este es el caso de Cracolici et al (2008) que realiza una aplicación de este función de producción compleja para el caso de estudio de las 103 regiones de Italia, contrastando los resultados obtenidos por medio de la aplicación del DEA y del modelo de frontera estocástica y el de Suzuki et al. (2011), quien plantea un estudio de características similares, incluyendo como principal aportación metodológica la incorporación al modelo DEA la variable de minimización de la distancia euclídea. Este mismo planteamiento de función de producción compleja, es el que seguiremos en las dos primeras aplicaciones empíricas que incluimos en la tesis, si bien con la aportación de considerar como output el flujo propiamente cultural, para lo cual no contamos con referencias previas en la literatura.

Por otro lado, existen una serie de trabajos que amplían la escala de análisis, y centran su estudio en unidades territoriales macro como son los países. Hadad et al. (2012) aplica un modelo DEA sobre una muestra de 105 países, diferenciando entre economías desarrolladas y no desarrolladas, obteniendo un ranking de eficiencia. Por su parte, Assaf y Josiassen (2012), realizan un análisis de eficiencia condicionada, combinando DEA con un análisis de regresión truncada y procedimiento bootstrap, para una muestra de 120 países. Y por último Soysal-Kurt (2017), quien realiza un análisis de eficiencia técnica sobre una muestra de 29 países dentro del continente Europeo.

No obstante, el fin último de un destino, no sería tanto ser eficiente, sino que este es un medio para alcanzar una mayor competitividad, es decir obtener ventajas frente a sus rivales a fin de atraer hacia si el mayor número de turistas (Mazanec y Ring, 2011). Según el trabajo de Sainaghi et al. (2017), junto a los análisis de eficiencia, los trabajos de análisis de la competitividad son de igual manera muy abundantes, siendo especialmente abundantes aquellos que se abordan por medio de la construcción de indicadores sintéticos. El planteamiento básico de esta metodología consiste en aglutinar los diferentes factores que hacen competitivo a un destino, en el más amplio sentido (sector hotelero, trámites de acceso al país, acumulación de recursos culturales, nivel de seguridad, etc.), en un único indicador sintético. Los resultados obtenidos son fácilmente interpretables y comparables, siendo habitual su representación a modo de ranking de competitividad turística.

Las metodologías que permiten construir este indicador sintético son múltiples y varían principalmente en base a su nivel de complejidad, dando especial importancia al método para asignar los pesos con los que cada uno de los factores va a contribuir a la construcción del indicador sintético. Existen modelos construidos en base a medias simples, cuyo mejor ejemplo es la publicación bianual del Travel and Tourism Competitivenes Report (T&TCI) del World Economic Forum (WEF, 2017), donde se sintetizan aproximadamente 90 factores turísticos. Sin embargo, su planteamiento ha recibido múltiples críticas. Es por ello que, en base a los resultados obtenidos por el WEF, diferentes autores proponen metodologías más complejas y objetivas para construir un indicador sintético de CDT. Mazanec y Ring (2011) otorgan los pesos en base al Partial Least Square-Path Modelling, según la capacidad explicativa que tienen cada uno de los factores sobre el T&TCI. Por su parte Lan et al. (2012), emplean un método no paramétrico, el Neural Network Análisis, para obtener pesos objetivos para cada uno de los recursos turísticos a sintetizar. Croes y Kubickova (2013) aplican el Coeficiente de Pearson, obteniendo como valor para los pesos la correlación entre cada factor y el resultado del T&TCI. Una de las aportaciones más recientes es la de Pérez-Moreno et al. (2016), quienes aplican un modelo multi-criterio, como alternativa para el

modelo de normalización y agregación, dando solución además al problema de sustituibilidad entre factores. Por su parte, Martín et al. (2017) proponen la utilización del DEA en su enfoque "Beneficio de la duda", para construir un indicador sintético de competitividad turística en base a pesos idiosincráticos.

5. Aportaciones de la investigación doctoral

En este epígrafe se van a sintetizar las principales contribuciones que se han alcanzado en el desarrollo de esta tesis doctoral, y que pueden resumirse en tres grandes bloques: aportaciones al desarrollo de la línea de investigación de evaluación de la competitividad turística, contribuciones metodológicas según la aplicación de diferentes modelos econométricos para medir la eficiencia turística de los destinos, y obtención de un diverso número de conclusiones en relación a los resultados prácticos.

En primer lugar, podemos afirmar que se ha contribuido a desarrollar y fortalecer la línea de investigación de la evaluación de la eficiencia y competitividad de los destinos turísticos. Con la realización de esta tesis doctoral se han aportado un total de cinco casos, planteados desde diversos puntos de vista, tanto en términos del objeto de estudio, flujo turístico analizado (cultural y total, doméstico e internacional), como en la escala de las unidades de análisis tenidas en consideración (regional y nacional), lo cual responde a la diversidad y complejidad del sector analizado. Cabe destacar además que, según nuestro conocimiento, los trabajos realizados cubren contextos geográficos hasta el momento no analizados bajo estos supuestos analíticos, como el caso de la aplicación sobre las regiones de Chile y el del análisis de una muestra de países de Latinoamérica y el Caribe. De igual modo, tampoco tenemos constancia de aplicaciones empíricas en las que se evalúe la eficiencia en la gestión de los flujos turísticos de carácter estrictamente cultural, como el realizado para el caso español, por lo que ha supuesto un desafío analítico especialmente novedoso.

En segundo lugar, se han desarrollado varias aportaciones metodológicas en los diferentes estudios acometidos. Por un lado, en cuanto al planteamiento conceptual del proceso de optimización con el que los destinos maximizan su flujo turístico, se han propuesto dos alternativas. La consideración, en los dos primeros trabajos, de una función de producción compleja, en la que se analiza el flujo turístico propiamente cultural, en base a los recursos culturales presentes en los destinos, tanto de trabajo como de capital, considerados como los principales inputs de una función de producción territorial. Por el contrario, en los estudios tercero y cuarto, se diseña una función de producción sencilla en la que se analiza la eficiencia en términos estrictamente gerenciales, en el sentido de que se optimiza el impacto del flujo turístico de acuerdo a las dotaciones de alojamiento y llegadas de visitantes. En este

caso, consideramos el turismo como flujo completo, visitantes nacionales o internacionales, cualquiera que sea su motivación.

De forma paralela a las aportaciones conceptuales expuestas, se ha alcanzado un desarrollo metodológico significativo, con respecto al procedimiento estadístico y econométrico que sustenta los diferentes análisis de evaluación de la competitividad turística. En los tres primeros trabajos se han aplicado combinaciones de la metodología DEA, para estimar los ratios de eficiencia, con diferentes modelos de análisis de regresión, para observar el efecto condicionante de los factores externos, tales como modelos truncados, Tobit, Tobit robusto y bootstrap. En el cuarto, se aplica un modelo estadísticamente más refinado, como es el proceso de doble bootstraping de Simar y Wilson (2007), que genera unos resultados insesgados, por medio de la estimación de intervalos de confianza sobre los coeficientes de la regresión, considerándose uno de los modelos más adecuados para evaluar la eficiencia condicionada. La última aportación metodológica de nuestra tesis, se produce en el quinto trabajo, y consiste en la propuesta de una medida alternativa de competitividad turística, por medio de la construcción de un indicador sintético. El análisis entronca con los realizados en los estudios anteriores, ya que se ha empleado igualmente el modelo DEA, pero en este caso con su aproximación del "Beneficio de la Duda" con el que, por medio de una modificación en su formulación, se construyen indicadores compuestos. A ello se suma la depuración de los resultados por medio de técnicas multicriterio, que permiten la construcción de un ranking de competitividad, lo que hace más sencilla la comprensión de los resultados. Según nuestro conocimiento, no existe ninguna referencia que emplee un proceso de pesos endógenos, por medio del modelo DEA y técnicas multicriterio, para construir indicadores de competitividad turística. De nuevo, entroncando con la metodología de los anteriores trabajos, este análisis se complementa con un modelo de estimación bootstrap, siguiendo el planteamiento de Simar y Wilson (2007), y que permite contrastar qué factores externos, tales como el nivel de corrupción, la globalización, la calidad de la democracia, etc., afectan a la competitividad estimada.

En tercer lugar, con la realización de esta tesis doctoral se ha contribuido al conocimiento de la competitividad de los destinos turísticos, por medio de la obtención de toda una serie de resultados y utilidades prácticas, fruto del análisis de cada uno de los casos de estudio. El nivel de especificación de los resultados nos permite extraer conclusiones concretas y aplicables dentro del ámbito turístico.

Se ha podido demostrar que los recursos culturales determinan significativamente el flujo turístico, tanto el de motivación cultural, como el genérico. Si bien, existen resultados contrapuestos. En los estudios que se centran en el análisis del flujo turístico internacional,

los recursos culturales generan un efecto claramente positivo sobre la eficiencia o la competitividad turística. Especialmente significativo e interpretable es el caso del resultado obtenido en el quinto trabajo, donde hemos podido observar como las variables que sintetizan los recursos culturales poseen el mayor peso en la construcción del indicador sintético, lo que refleja la importancia que tienen sobre la competitividad turística. En esta misma línea están los resultados obtenidos para el análisis del flujo turístico internacional de Chile y América Latina y el Caribe. Por contra, en los estudios que analizan el flujo de turistas nacionales, la tendencia es inversa. Los recursos culturales generan un efecto significativo, pero negativo en el caso de España, mientras que en Chile resulta una variable no concluyente. Este efecto opuesto, nos indica que los turistas nacionales tienden a aquejar en mayor grado el efecto de la congestión turística asociado a los grandes iconos culturales, pues se demuestra que huyen de las zonas más masificadas en relación a una mayor notoriedad de elementos culturales. Los turistas internacionales, en cambio, tienden a viajar a los destinos más notorios y con la mayor cantidad de recursos culturales.

Además, hemos podido observar cómo los destinos turísticos analizados poseen, en líneas generales, un margen considerable de mejora de su eficiencia, en base a los recursos productivos con los que cuentan. Especialmente evidente en los casos de turismo internacional, como refleja el porcentaje acumulado de aproximadamente el 70% de mejora que en el caso de España se podría alcanzar en relación a los recursos de los que disponen y del 26% en el de Chile. Cabe señalar la importante diferencia en el margen de mejora en la eficiencia de la gestión del flujo de turismo internacional, que poseen los destinos de América Latina frente a los del Caribe, con un 75% y 28% respectivamente. En relación a ello, también hemos observado como en la mayoría de los estudios, el resultado de la eficiencia tiende a caer ligeramente con el paso de los años considerados. Ejemplo de esta variación es el -2% que se registra en las regiones de Chile, y el algo más pronunciado -5% de los turistas culturales nacionales de España. El descenso en la mayoría de los casos resulta, a priori, contradictorio con la manifestada expansión del sector en los ámbitos analizados. Encontramos varios motivos para justificar este efecto. En primer lugar, el boom turístico de los últimos años, cifrado en una cada vez mayor llegada de turistas, no implica que el turismo este ganando en eficiencia en su gestión frente a los años anteriores. El efecto de la crisis ha podido retraer en cierta medida la duración de la estancia de los turistas. A esto se suma los cada vez más numerosos destinos potenciales a escala internacional, lo que acaba por reducir de nuevo el impacto turístico en cada territorio, ya que favorece los viajes multi-destino. Por otra parte, señalar como un factor clave la sobredimensión observada en torno a la infraestructura turística, principalmente medida por el número de camas disponibles en alojamientos hoteleros. Esta sobredimensión parece responder, en buena parte de nuevo, al

boom que el sector turístico ha vivido en las últimas décadas. Ante la llegada progresiva de un número cada vez mayor de turistas, los destinos han aumentado sus dotaciones en infraestructuras hoteleras, sin embargo, este crecimiento parece sobrepasar el ritmo creciente de llegada de número de turistas, generándose una sobreabundancia de dotaciones hoteleras.[3]

De forma complementaria se ha observado la importancia de diferentes variables externas sobre la eficiencia alcanzada por los destinos turísticos. Este es el caso de la importancia constatada que el entramado empresarial, de naturaleza generalmente privada, posee sobre la eficiencia turística, cuantificado por medio de empresas turísticas o trabajadores dedicados a labores dentro del sector. Hemos observado cómo tienen una especial incidencia en la evaluación de los flujos nacionales, tal y como representan los coeficientes en los análisis para España y Chile. Por su parte, las infraestructuras, medidas por medio de disponibilidad de hoteles, posibilidades de acceso por medio de aeropuertos o la longitud de la red de autopistas, entre otros, de nuevo muestran un patrón contrario. En los trabajos que analizan el flujo de turismo internacional, tienen una especial contribución, como demuestra el resultado de las regresiones realizadas en el contexto de Latinoamérica y el Caribe. También para la construcción del indicador sintético, donde el bloque de variables que aglutinan las dotaciones en infraestructuras, es el segundo que más peso tiene en la construcción del indicador de competitividad. Por el contrario, para el caso de los turistas nacionales, la mayor cantidad de infraestructuras perjudica a la eficiencia, lo que refuerza el argumento anteriormente esgrimido, de que el turismo doméstico tiende a huir de los destinos más aglomerados. Por su parte los turistas internacionales, acuden a las zonas con mayores dotaciones, que por otro lado, son más fácilmente accesibles y les ofrecen mayores comodidades. De igual modo, en los diferentes análisis de regresión queda patente el carácter omnívoro de los turistas de origen internacional. Esto se refleja en la significatividad de factores determinantes de carácter muy diverso, y que complementan a los relacionados con los consumos culturales, tales como recursos naturales y otras alternativas de ocio, principalmente las relacionados con el turismo de sol y playa, etc. Esto sugiere algo que, por otro lado es evidente, y es que los turistas internacionales realizan un esfuerzo elevado al viajar y, por lo tanto, tratan de diversificar sus consumos a fin de alcanzar una experiencia completa en el destino receptor.

[3] A esto se suma las nuevas opciones de alojamiento turístico que han empezado a popularizarse en la última década. Un buen ejemplo de ello sería la plataforma de alquiler de alojamientos particulares Airbnb. En el momento de realizar esta tesis doctoral, no contamos con información oficial de este tipo de hospedaje. Sin embargo, su auge apunta a que puede estar atendiendo a una parte importante de la demanda de alojamiento turístico, y por lo tanto contribuir a la sobredimensión señalada.

Finalmente, las utilidades prácticas que se desprenden de la elaboración de esta tesis doctoral son de interés, tanto en el ámbito de la gestión, como en el de la investigación, en el propósito conjunto de búsqueda de entendimiento de la casuística de la evaluación de competitividad de los destinos turísticos. Una de estas utilidades consiste en la obtención de resultados que permiten generar comparaciones entre destinos. En cada uno de los trabajos se ha podido representar la competitividad a modo de ranking que, aun cuando sea necesario interpretarlos con cierta cautela, tiene la utilidad de mostrar la posición relativa que un destino ocupa frente a sus rivales. Además, los resultados obtenidos proveen de importante información que puede ayudar a identificar de forma clara las fortalezas y debilidades que los destinos poseen. Ubica con total precisión los factores que en mayor medida están restringiendo la capacidad de los destinos para ser competitivos, y del lado contrario, localiza los factores que en mayor medida contribuyen a la competitividad y consecuente atracción turística. La investigación comporta también una utilidad metodológica aplicada, como es la demostración de la capacidad explicativa que poseen los instrumentos y procedimientos analíticos desarrollados para el conocimiento del sector turístico en general, y la evaluación de los destinos turísticos en particular.

Tras esta revisión de las aportaciones de nuestro trabajo se incluyen, como capítulos diferenciados, cada una de los cinco trabajos de investigación que se han planteado y que conforman el cuerpo y contribución principal de esta tesis doctoral, tras ellos se resumen las conclusiones generales que de ellos se pueden extraer.

CAPÍTULO 1.

Cultural resources as a factor in cultural tourism attraction: Technical efficiency estimation of regional destinations in Spain

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Cultural resources as a factor in cultural tourism attraction: Technical efficiency estimation of regional destinations in Spain

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Abstract

The article involves a study along the line of performance analysis of tourist destinations, yet taking the regions as territorial units and cultural tourism as a tourist flow to be explored. The aim of this study is therefore to evaluate the technical efficiency of regions in attracting greater flows of cultural tourism considering their own cultural resources available in the medium term. The analysis will be carried out at a regional disaggregation level in Spain, and one hypothetical production function will be designed to link cultural resources and demand. We adopt a two-stage procedure to evaluate regional efficiency as cultural destinations: first, measuring performance by non-parametric methods; and second, analysing how other external variables might determine these efficiency ratios. In this case, we consider indicators representing reputation, accessibility, the omnivorous nature of cultural tourism as well as the scope to the regional cultural sector. The findings of this research have implications for economic development and regional disparity analysis and may also prove to be of potential interest vis-à-vis economic policy.

Keywords

cultural tourism, data envelopment analysis, tourist destinations, performance of cultural efficiency analysis, regional analysis, two-stage procedures

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The main idea underlying the present work is the relation between cultural tourism flows arriving at various regions, and the combined cultural resources available in said destinations. Indeed, if we take a fairly broad definition of cultural tourism, such as the movement of people from their usual place of residence to other destinations for the purpose of gathering information and enjoying new experiences with which to satisfy their cultural needs (Bonet, 2011; Richards, 1996), the cultural resources and events found in a given area emerge as the main attractions that compete with one another to draw visitors for the aforementioned aims. Cultural tourism is thus able to embrace a wide array of activities ranging from visiting museums, monuments, archaeological sites and the like, to attending performing and musical arts festivals and shows, or offering guided tours of historical cities and cultural sites, as well as attending celebrations and events which are representative of intangible cultural heritage (Benhamou, 2012; Bonn et al., 2007).

The link between cultural resources and their specific tourism demands seems clear. Yet, in terms of cultural economics analysis, it has been approached from a number of different perspectives. On the demand side, efforts have been made to specify the idiosyncratic nature of cultural tourists (Kim et al., 2007; McKercher, 2002), their particular motivations (Guzmán et al., 2006) or the impact of tourism on cultural consumption (Borowiecki and Castiglione, 2014). On the supply side, many works have explored participation in various tourist experiences (Richards, 2001) or estimated the value allocated to certain manifestations of culture (Bedate et al., 2004; Herrero et al., 2011). Other studies have sought to measure the contribution of cultural tourism to economic growth (Murillo et al., 2008; Stoddard et al., 2006) or estimate the economic impact of certain events (Devesa et al., 2012; Herrero et al., 2006). Finally, another group of contributions address the issue from the standpoint of public intervention by evaluating public spending on tourism (Cellini and Torrisi, 2013) or related tourist policies (Wöber and Fesenmaier, 2004).

Our work explores an issue which has thus far received less attention in the field, namely evaluating the efficiency of cultural tourism destinations. More specifically, our main purpose is to measure how efficient regions might be when attempting to manage their own cultural resources in order to attract the highest possible number of cultural tourists. Obviously, to maintain this argument, we need to involve specific work hypotheses. First, we assume that we are able to design a regional production function which takes account of cultural (material and human) resources as inputs and cultural tourism as final output. We therefore take the territory as a firm and hypothesize that cultural resources in a given region constitute the input of a virtual production process, the output of which is cultural tourism flow (Cracolici et al., 2008). Second, and stemming from the previous issue, we think that regions are capable of managing and accumulating cultural resources for tourist purposes or at least with the aim of improving their ability to attract tourism (Richards, 2001). It is true that managing many cultural resources and institutions has a strictly cultural goal, such as conservation, restoration, encouraging creativity, promoting cultural participation and so on. However, it is no less true that many also seek to enhance the image of the urban area and to attract greater spending in cities and regions; in other words, to be a factor in local and regional economic development (Bille and Shulze, 2006; Herrero, 2011)

The third hypothesis of our research involves defining a cultural tourist as someone who makes a trip entailing a stay of at least 1 night and whose motivation is essentially cultural, that is to say, cultural participation or cultural consumption during their trip. This by no means rules out those who merge their cultural visits with other leisure activities, the so-called ‘omnivorous tourism’ phenomenon which is acquiring such importance in the field (Barbieri and Mahoney, 2010). Yet, what needs to be clarified is that the classification of a cultural tourist should come exclusively from the individual’s own declaration concerning the main reasons for their trip and the cultural

affinity involved. However, this poses certain problems when constructing reliable and significant data since all the information should always come from specific surveys of tourists. Finally, a fourth hypothesis in this relation between cultural tourism flow and cultural resources suggests the existence of other variables which might determine the degree of efficiency, and which are possibly related to the conditions of accessibility, the reputation of the place, the cultural sector scope and so on. This is why we propose a two-stage procedure to evaluate the performance of cultural destinations (Banker and Natarajan, 2008; Simar and Wilson, 2007): first, measuring regional efficiency by non-parametric methods, and second, analysing how other external variables may determine this efficiency.

Considering these premises, the main research objectives of the article are therefore twofold. First, we try to estimate technical efficiency scores for regional destinations in Spain with regard to the production of cultural tourism flows, achieved by using a non-parametric data envelopment analysis (DEA) method. Second, we examine environmental factors as determinants of technical efficiency scores by employing multivariate regression analysis. As mentioned, the empirical application is conducted on all the regions in Spain, an exceptional case study, due both to the importance of its cultural resources and the scope of related cultural tourism as well as to the existence of a highly decentralized political system, endowing the regions with enormous power to intervene, particularly vis-à-vis managing and promoting cultural resources. The article is organized as follows: In the next section, a brief literature review is provided. In the section 'Methodology and data set', the methodological approach and database used are presented. The section 'Empirical application' provides the empirical application, measuring regional performance, following the two-stage procedure mentioned above. We finish with a section of discussion and main conclusions.

Literature review

This research is framed within the efficiency analysis of culture and tourism. In this field, abundant case study literature addressing the evaluation of cultural institutions already exists (Fernandez Blanco et al, 2013), although the cultural sector may not have as yet received the same amount of attention as given to other areas in the provision of public goods, such as health or education. Certain studies focus on estimating stochastic production frontiers using parametric methods such as the works of Bishop and Brand (2003), addressing a selection of museums in the United Kingdom, or Zieba (2013) and Last and Wetzel (2010) on efficiency of several samples of theatres in central Europe. Yet, a greater number of efficiency studies have been conducted based on non-parametric mathematical programming techniques, particularly DEA and derivatives thereof. Based on the flexibility this technique provides, there have been numerous applications since the 1990s, above all in the field of museums. Mairesse and Vanden Eeckaut (2002) evaluated samples of Belgian museums, and the work by Taalas (1998) is one of the few approaches to evaluating allocative efficiency using a set of Finnish museums. In Italy, Pignataro (2002) explored efficiency and technical change in museums in Sicily, while Basso and Funari (2004) offer a detailed appraisal of productivity gains for a set of museums located in large tourist cities. In Spain, Del Barrio et al. (2009) evaluate the efficiency of a wide network of museums based on a prior classification thereof using multivariate statistical techniques and also considering a complex production function with several sets of inputs and outputs (Del Barrio and Herrero, 2014). Studies of a similar nature have also emerged for orchestras (Luksetich and Nold Hughes, 1997) and theatres (Marco Serrano, 2006). Only recently, however, have conditioned efficiency models in a two-stage procedure been applied to evaluate cultural institutions such as libraries (De Witte and

Geys, 2011; Vitaliano, 1998) or historical heritage restoration agencies and policies in Italy (Finocciaro Castro et al., 2011; Guccio et al., 2014).

By contrast, there are an abundant and ever-increasing number of efficiency literature studies in the specific field of tourism and hospitality sectors. In addition to providing an extensive literature review in this area in recent years, Fuentes (2011) examines the efficiency of travel agencies in a Spanish case study using DEA and smoothed bootstrap techniques. Köksal and Aksu (2007) also evaluate travel agencies in Turkey using a simple DEA model with one output and three inputs, while Wöber (2006) considers non-controllable inputs in the efficiency analysis of branch offices of a tour operator in Austria. Giménez-García et al. (2007) and Reynolds and Thompson (2007) examine the efficiency of restaurant establishments in Spain and the Unites States, respectively, from a DEA perspective. However, most studies in the tourist industry basically deal with efficiency analysis of hotels and hotel chains from a variety of different perspectives. Some studies estimate stochastic production frontiers, such as the applications of Barros (2004, 2006) for several Portuguese hotel samples. Yet, most works on efficiency studies adopt an approach using non-parametric, basically DEA, in different versions. Such is the case of the studies by Sigala (2004) on three-star hotels in the United Kingdom, Perrigot et al. (2009) on hotel chains in France, or Barros (2005) who explores the efficiency of the Portuguese Pousadas, a publicly owned chain of national hotels. Pulina et al. (2010) merge tourist efficiency studies in Italian regions with a detailed analysis of the efficiency of hotels on the island of Sardinia, using a window DEA approach, namely, analysing how hotels perform at different periods. Adopting the same approach, Keh et al. (2006) examine the productivity of marketing expenses in the units of an Asian Pacific hotel chain. Finally, Wang et al. (2006) and Shang et al. (2010) apply conditional efficiency models in two stages, complementing the DEA approach by means of a Tobit regression to analyse the efficiency of international tourist hotels in Taiwan, as well as Assaf and Agbola (2011) use the same approach to evaluate the performance of Australian hotels.

Nevertheless, what is more closely related to our research is the efficiency of tourist destinations, an issue which has come to the fore in recent years. The argument for this type of study revolves around the concept of territorial competitiveness in the field of tourism (Crouch and Ritchie, 1999), or how tourist destinations are able to deploy the inputs at their disposal in an efficient manner in order to attract a maximum share of tourist demand and to remain competitive against key rivals. Most of these studies adopt a two-stage approach to evaluate efficiency, mainly following the procedure proposed by Simar and Wilson (2000, 2007). First, they usually consider an extremely simple regional production function by basically relating the number of nights slept as a function of accommodation capacity and tourist arrivals. For this first analysis, non-parametric techniques such as DEA are usually employed. At the second stage, a regression is performed between the efficiency scores and other environmental variables, such as cultural and natural resources, safety, accessibility conditions and so on. With regard to this approach, we may mention the works of Barros et al. (2011) and Botti et al. (2009) for the efficiency evaluation of French destinations, Benito et al. (2014) who analyse the performance of Spanish regions, and Cuccia et al. (2016) who focus particularly on ascertaining whether or not United Nations Educational Scientific and Cultural Organization (UNESCO) nominations determine tourist flows travelling to Italian regions. There are also other contributions which focus on constructing and evaluating a more sophisticated production function using DEA, including, as input, some of the variables previously considered to be external. Such is the case of the evaluation studies of Italian tourist regions conducted by Cracolici et al. (2008) and Suzuki et al. (2011), which include cultural resources, total beach length, educational attainment levels and tourist sector employment among

the inputs. Following the same approach, Hadad et al. (2012) rank the efficiency of developed and developing countries in attracting tourism and tourist expenditure. Finally, other studies such as Pulina et al. (2010), who use revenue from tourism and labour costs to evaluate Italian regions, include the financial support aspect when analysing tourist destination efficiency, or Wöber and Fesenmaier (2004) who propose benchmarking tourism destinations by assessing state tourism advertising programmes in the United States.

Methodology and data set

All of the previous approaches seem logical since most consider an extremely managerial production function (nights slept vs. accommodation capacity and tourists) and explore the external variables involved in this relation, taking into account the whole tourist flow that comes to a region, whatever its motivation. Nevertheless, our contribution differs greatly. First, because we expressly consider cultural tourism flow itself, namely those who declare a cultural purpose as the main reason for travelling. Second, because we consider as determinants of this flow, all of the cultural resources available in a region which act as the main magnet of the region's appeal. As a result, we consider a regional production function, which is clearly understood, but which proves more complex to manage and to explain. On the one hand, it consists of cultural tourism as output, and on the other hand, cultural capital and labour as inputs. As regards cultural resources, we include festivals, museums and historical heritage and add cultural employment in the region as a labour factor. We feel that by using such resources as these, we cover most of a region's cultural attractions: the area of performing arts, music and cinema by way of cultural festivals; museums, which are the expression of the most emblematic movable cultural heritage and also represent one characteristic institution in this area and finally immovable historical heritage, that is buildings, historical ensembles, archaeological sites and so on, which are given special protection by the authorities due to their relevance (Bienes de Interés Cultural - Goods of Cultural Interest, as it is referred to in Spanish administration).

As a result, for all the regions in Spain and for even years between 2004 and 2012, we have constructed a database, which is initially 17 units, the number of autonomous regions in Spain, five variables and five time periods such that our data set is a balanced panel data with 85 observations. Regarding output, cultural tourism flow is taken from FAMILTUR, a data set published by the Spanish Institute of Tourist Studies which performs a nationwide survey in Spain,[1] estimating the scope and features of domestic tourism flow classified by regions (origin or destination) and by main trip motivations. Specific cultural motivation for tourism flow has therefore been selected for our study.[2] As regards input variables, namely cultural resources and employment, data are obtained using the CULTURABase, a database published by the Ministry of Education, Culture and Sport.[3] Overall, the variables comprising the production function appear in Table 1. It should be pointed out that the analysis is restricted to national tourist flows, in other words the movement of residents in Spain, and excludes foreign tourists, whatever their reason for being in Spain.[4] In addition, and given the cultural purpose of the trip, excluded are domestic tourists who may make cultural visits during their stay but for whom said visits are not the stated objective of their trip. These restrictions may seem like limitations in the research, yet in the present study, they are felt to be restrictions that are applicable to a well-defined case study such as the analysis of cultural tourism and how efficient regions are in specifically attracting it.

The methodological approach we adopt follows a two-stage conditioned efficiency evaluation model. We first evaluate the level of efficiency of regions as cultural tourism destinations applying

Table 1. Variables and descriptive statistics.

Variables		Mean	Standard deviation	Variance	Minimum	Maximum	Range
First stage: Regional production function							
Festivals	Number of festivals by region	124.1	109.5	11,992.0	21.0	409.0	388.0
Museums	Number of museums by region	87.4	59.3	3521.5	8.0	206.0	198.0
Heritage Sites	Number. of protected heritage sites by region	798.4	835.3	697,679.7	103.0	2890.0	2787.0
Cult-Employment	Cultural employment in 1000 s by region	30.0	36.9	1364.2	3.8	139.1	135.3
Cult-Nat Tourism	National cultural tourism in 1000 s by region	500.5	381.9	145,815.7	61.5	1795.0	1733.5
Second stage: Environmental variables							
WHL-Acc	Number of WHL cultural sites by region weighted by years of inscription	44.7	30.4	923.7	6.0	134.0	128.0
Hotels-Total	Number of hotels by region in 1000 km2	19.0	14.6	213.6	2.5	60.4	57.9
Hotels-345 H Stars	Number of three-, four-, five-star hotels by region in 1000 km2	12.1	12.1	146.0	1.1	53.2	52.1
BedsH-Total	Number of beds in hotels per square kilometre by region	3.6	6.3	39.6	0.2	30.6	30.4
Beds-345 H Stars	Number of beds in three-, four-, five-star hotels per square kilometre by region	3.3	6.1	36.6	0.1	29.7	29.5
Rural-H	Number of rural hotels by region in 1000 km2	35.7	28.2	792.6	4.8	124.2	119.4
Rural-B	Number of rural beds by region in 1000 km2	33.9	26.0	674.0	1.4	112.3	110.9
Motorways	Kilometres of motorways by region per 100 km2	4.1	2.5	6.4	1.0	12.3	11.3
Coast	Kilometres of beaches by region per 100 square kilometres	4.4	7.8	61.5	-	28.6	28.6
Natural parks	Surface of natural parks by region per 1000 km2	9.0	12.6	159.4	-	44.0	44.0
No-Cult-Nat-Tourism	National tourism by region 1000 inhabitants, excluding cultural motivation	41.8	27.4	65.5	9.7	129.5	119.8
Internat Cult Tourism	International tourism with cultural participation during their trip by region 1000 inhabitants	13.9	23.7	170.7	0.1	99.2	99.1
Cult-Enterprises	Number of cultural enterprises by region per 100 km2	32.6	55.7	3098.8	2.1	288.9	286.8
Safety	Number of crimes and thefts by region 1000 inhabitants	16.6	17.2	296.2	1.2	83.5	82.3
Cult-Expenditure	Cultural expenditure by regional government per 1000 inhabitants	42.6	21.4	455.7	9.0	126.7	117.7

Note: WHL: World Heritage List.

Source: Cultural tourist flow is taken from the FAMILITUR survey of the Institute of Tourist Studies (www.iet.es), whereas the rest of the data are taken from the Ministry of Education, Culture and Sport (www.mcu.es/culturabase) and National Institute of Statistics (www.ine.es).

non-parametric techniques - DEA, on the basis of the regional production function explained before. DEA is a mathematical programming technique designed to evaluate the relative efficiency of a group of comparable decision-making units (DMUs), in our case, regions as cultural destinations. The advantages of this method hinge on the fact that it does not require specifications in the behaviour model of the decision units or explicit functional forms of the production function. The latter approach consists of a simple definition of a production frontier comprising the best units, prior to quantifying how efficient the rest of the sample is in relation to distance from the frontier. This distance could therefore be understood as a relative measurement of DMU performance. By contrast, DEA is a deterministic model since it assumes that any distance from the optimal frontier is the result of inefficient performance and does not consider that inefficiency may be due to other random factors which could affect the production process. The non-parametric DEA method also requires homogeneous selection of assessed units employing similar inputs to produce similar outputs in similar operational environments. When this assumption is violated, low efficiency scores might in fact be due to unobserved heterogeneity that affects the production frontier rather than inefficiency per se. These issues cannot easily be resolved unless parametric methods such as stochastic frontier analysis are employed.[5] Nevertheless, and with regard to our case study, DEA might prove appropriate as it consists of a very small sample (17 units over five time periods) where the individual units (the regions) are relatively homogeneous with respect to their inputs/outputs and with respect to environmental factors. Moreover, in order to consider environmental variables and to provide information concerning the direction of their impact on production efficiency, we consider a two-stage approach by way of a regression between efficiency scores and a set of these external factors.

As regards DEA, the distance between observed DMU and the most efficient DMU gives a measure of the radial reduction in inputs that could be achieved for a given measure of output, which responds to a model oriented to minimizing inputs. Contrastingly, if we follow a model oriented to maximizing outputs, the distance expresses the potential radial increase of output given a level of inputs. To describe this latter point, which is the approach we adopt in this research, let us consider n DMUs to be evaluated. A DEA output-oriented efficiency score ϑ_i is calculated for each DMU solving the following program, for i ¼ 1, . . . , n, in the case of constant returns to scale (CRS):

$$\begin{aligned} &\text{Min } \lambda, \theta i \qquad \theta i \\ &\text{Subject to} \qquad Y\lambda - yi \geq 0 \\ &\theta i\, xi - X\lambda\, yi \geq 0 \\ &\lambda \geq 0 \end{aligned} \qquad [1]$$

where x_i and y_i are, respectively, the input and output of ith DMU; X is the input matrix and Y is the output matrix of the sample and λ is a n × 1 vector of variables. The model (1) can be modified to account for variable returns to scale (VRS) by adding the convexity constraint: eλ ¼ 1, where e is a row unity vector with all elements equal to 1, which allows pure technical efficiency and scale efficiency to be distinguished.[6] To provide a robustness check of the findings, we also employ a bootstrap procedure to investigate bias, variance and confidence intervals of the attained efficiency scores and to obtain unbiased efficiency rankings (Cuccia et al., 2016; Simar and Wilson, 2000).

Following our methodological approach, at the second stage, we attempt to estimate the degree of correlation of the previously obtained efficiency ratios with regard to other environmental variables which could affect regional performance in attracting cultural tourism. We sought to ensure that the production function considered variables that were more or less under the control of

the theoretical manager of the production function (variation in employment and regional cultural resources) as the environmental variables are not discretional, in other words, they are outside the scope of the decision maker, even though they might affect the performance of the production process. We have grouped these external variables into four concepts. First, reputation, in other words, whether cultural tourists decide their trips based on the importance of certain cultural ensembles or taking into account some well-known cultural brands. To include this notion, we build a variable which considers the World Heritage List (WHL) declared by UNESCO, and each nomination is weighted by the number of years since it was registered. We therefore consider the density and time relevance of cultural heritage labelling. The second concept merges variables related to accessibility of cultural destinations, such as accommodation capacity and presence of motorways, which allow easier and faster access to destinations. We take accommodation capacity to be the number of hotels and rural houses by region, as well as the number of beds included, with a special distinction for establishments up to three stars. We also take kilometres of motorways weighted by the size of the region. Third, we also take into account indicators which aim to measure the possible omnivorous nature of cultural tourism, in other words, whether visiting cultural attractions is combined with leisure activities involving other entertainments such as beaches or natural parks. We therefore bring into our analysis the length of beaches and the surface area of natural parks. With regard to this issue, omnivorous leisure, we also consider the scope of other tourism flows aside from the strictly cultural, assuming that they eventually use cultural resources and might impact the degree of efficiency. Specifically, as environmental variables, we consider the flow of national visitors excluding those with a cultural motivation, and the flow of overseas tourists who engage in some kind of cultural consumption during their trip. Finally, we also aim to test the importance of variables related to the regional scope of cultural activity, for instance cultural expenditure by regional governments, the number of cultural enterprises, or even variables related to levels of safety, basically crimes and thefts. Most of these variables are calculated in relation to regional area and are shown, together with the main descriptive statistics, in Table 1.

We perform the second-stage analysis running a regression with the efficiency scores as the dependent variable and the environmental variables as the independent ones. We thus assume that the efficiency scores can be regressed - in a cross-section framework - on a vector of environmental variables in line with the following general specification:

$$\theta_i = f(z_i) + \varepsilon_i \qquad [2]$$

where ⟨i represents the efficiency score from the previous stage, z_i is a set of possible non-discretionary inputs (environmental variables) and "i is a vector of error terms. Nevertheless, it should be recognized that efficiency scores might be correlated with each other and even with the exploratory variables used in the second term. For this reason and following Simar and Wilson (2000), we use bootstrapping to correct bias in the efficiency scores and we later apply truncated models in regression, since this proves more appropriate than censored-Tobit or ordinary least square (OLS) regressions (Benito et al. 2014; Simar and Wilson, 2007).

In order to introduce a brief preliminary description of data, what is the situation regarding cultural tourism in Spain. Bearing in mind that we are considering domestic cultural tourism, namely, movements of Spanish people for cultural reasons, it should be pointed out that this has experienced a slight drop due to the financial crisis (Figure 1), although curiously, the number of trips abroad has grown except for the last year of the analysis. We therefore have certain stability in national cultural tourism flows in recent years. Which regions enjoy the largest cultural tourism

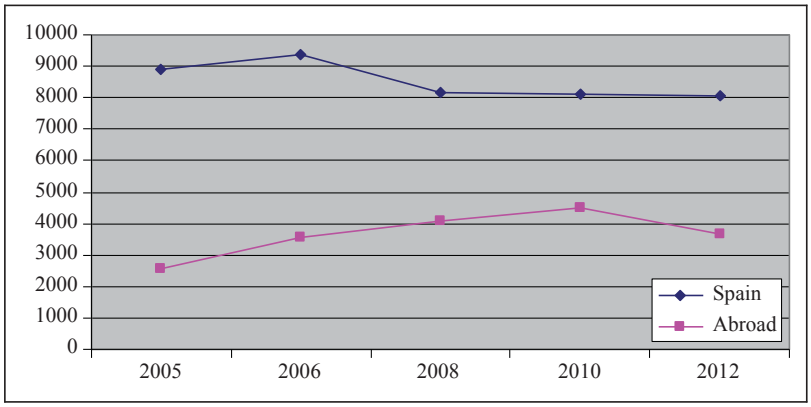

Figure 1. Evolution of national cultural tourism in Spain. By destinations (thousands of tourists). Source: Own elaboration based on data from the Ministry of Education, Culture and Sport through CULTURAbase (www.mcu.es/culturabase).

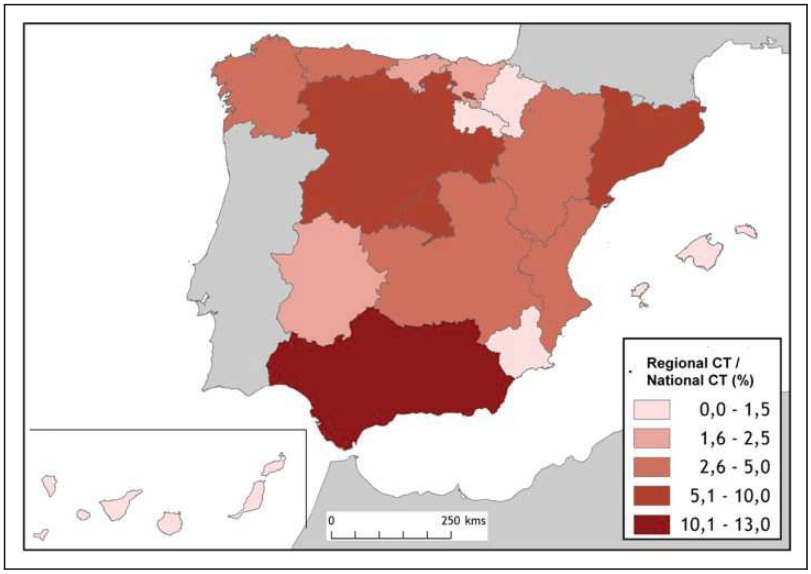

Figure 2. National cultural tourism allocation by regional destinations in 2012. Source: Own elaboration based on data from the Ministry of Education, Culture and Sport through CULTURAbase (www.mcu.es/culturabase).

flow? As we can see in Figure 2, Andalusia and Catalonia, together with the inland regions of Madrid and Castile and León, achieve the best results. These four regions account for over half of all domestic cultural tourism in Spain. Yet, in which regions does cultural tourism have the greatest weight in relation to total arrivals? Prominent here, obviously, is Madrid, as well as the inland regions of La Rioja and Extremadura, together with Asturias and the Basque Country (Figure 3). As regards cultural resources (Figure 4), inscriptions of the number of cultural interest goods have

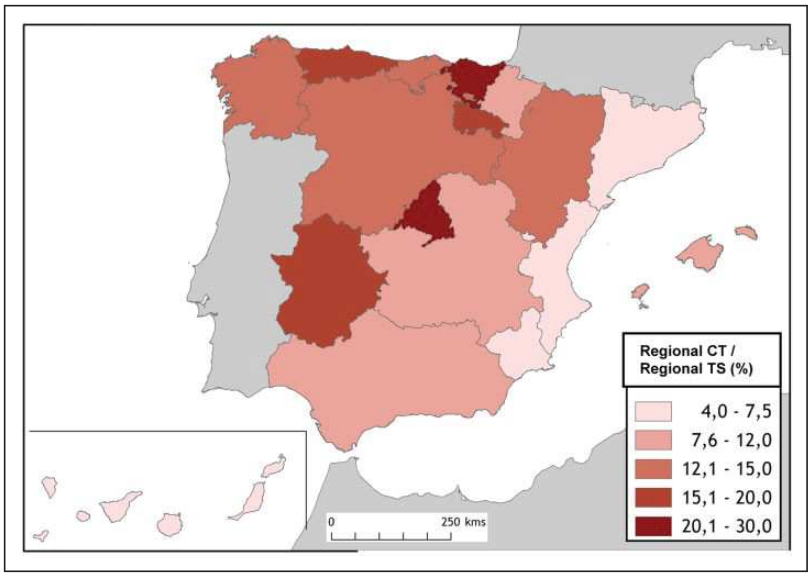

Figure 3. Proportion of cultural tourism on regional tourism sector IN 2012. Source: Own elaboration based on data from the Ministry of Education, Culture and Sport through CULTURAbase (www.mcu.es/culturabase).

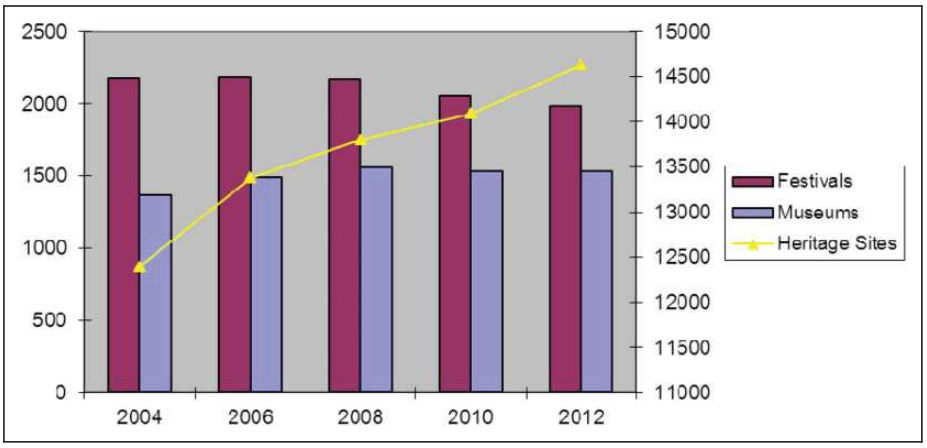

Figure 4. Evolution of cultural resources in Spain. Note: On the left, the number of festivals and museums; on the right the number of heritage sites. Source: Own elaboration based on data from the Ministry of Education, Culture and Sport through CULTURAbase (www.mcu.es/culturabase).

continued to grow and now include new historical heritage that should be protected, reflecting a desire to expand the domain of what is deemed cultural heritage. Nevertheless, the trend of opening new museums has come to a halt and the number of festivals has decreased after the financial crisis. The regions with most cultural resources are some from the Mediterranean arc together with Madrid (Figure 5), even though some have seen a drop in their number of resources, mainly festivals, while other regions are still increasing their endowment even during the financial crisis.

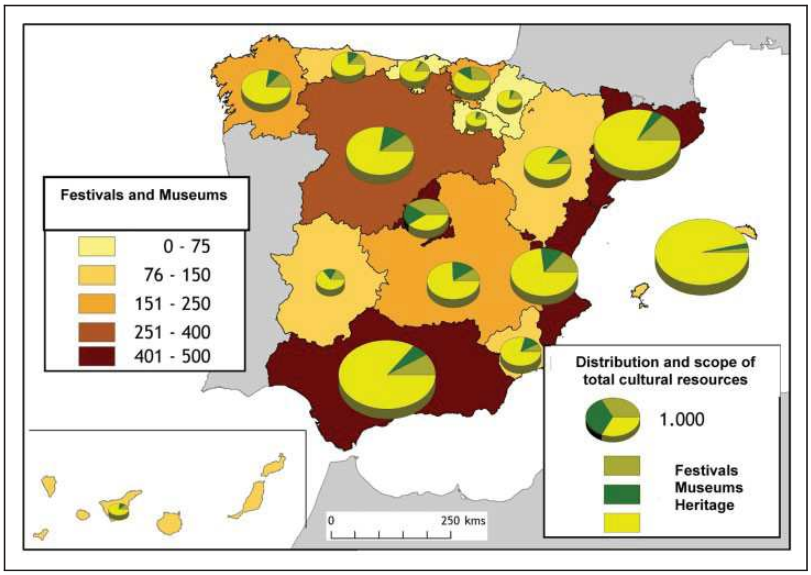

Figure 5. Regional distribution of cultural resources in Spain (2012). Source: Own elaboration based on data from the Ministry of Education, Culture and Sport through CULTURAbase (www.mcu.es/culturabase).

Empirical application

Performance evaluation of cultural tourist destinations

As regards, the results to emerge from the first stage of the empirical application, regional efficiency evaluation in attracting cultural tourism, we first engage the main points involved in the formulation of the DEA method. As pointed out earlier, with regard to the regional production function we consider four inputs, cultural employment, together with three elements which are representative of cultural capital, and one output, the flow of domestic cultural tourism.[7] Although the dimensionality space of the production function (numbers of input and output variables employed) is relatively short, we pool the data in order to gain greater consistency in the DEA model results. With this procedure, regions in different years are treated, as if they were different DMUs. This approach allows us to compare the efficiency of a DMU with its own efficiency in other years as well as with the other DMUs efficiency. Consequently, we also have a dynamic evaluation of regional performance as cultural destinations over time.

Efficiency assessment using DEA analysis may be performed by applying various models which are either input or output oriented. In our research, we chose the model we felt best suited to our case study, leading us to specify DEA analysis based on oriented output, namely maximizing outputs given the inputs. Using this approach, the optimal case frontier will comprise those regions which, with the same resources, achieve the maximum output level of cultural tourism, or to put it another way, what is the potential of maximum radial increase of a region's output (tourism flow), given the observed levels of its inputs (cultural capital and labour). We chose this type of approach as we felt that cultural resources are mainly a regional inherited endowment that could be managed either better or worse to achieve the greatest possible flow of cultural tourism. It is also the most

Table 2. Descriptive statistics of efficiency scores under CRS and VRS models.

	CRS model	VRS model
Number of efficient regions	3	17
Number of inefficient regions	82	68
Mean all sample	53.6	70.5
Median all sample	50.7	73.8
Mean inefficient regions	51.3	63.1
Standard deviation	22.5	24.1
Observations	85	85

Note: CRS: constant returns to scale; VRS: variable returns to scale.
Source: Own elaboration.

frequent approach in other studies of a similar nature (Barros et al., 2011; Benito et al., 2014; Cracolici et al., 2008; Cuccia et al., 2016).

As regards technical hypotheses, we consider CRS and VRS assumptions, Table 2 showing the main results from the DEA application to the panel data. As expected, the mean efficiency under VRS for all observations and the whole time period is slightly greater due to the flexibility of this technological hypothesis. Nevertheless, as of now we will only work with the results from the first hypothesis, since we consider CRS offers a measure of the overall efficiency of each unit, namely aggregating pure technical efficiency and scale efficiency, while the second only provides measures of pure technical efficiency. This assumption has often been challenged since it may not account for differences in the dimensions of tourist destinations. However, our concern is not to investigate scale inefficiencies but rather to seek out possible determinants of regional efficiency variations. Furthermore, we observe that the CRS approach is quite widespread in two-stage analyses in the literature mainly for two reasons: First, CRS scores exhibit more variability than VRS scores, and, second, CRS scores identify overall technical inefficiency as already mentioned (Cuccia et al., 2016).

Consequently, Table 3 indicates the main results of the efficiency analysis for each region and each year, considering a pooled DEA model and CRS technological hypothesis. The mean efficiency of the regions over the period may be estimated at 53.6%. This means that, when all sources of inefficiency are included, Spanish regions could improve their output by an average of around 46% given their current input levels. The mean level of efficiency has fallen slightly over the years,[8] such that the best practices frontier comprised four regions in 2004 and 2006, yet none in the following years. If we take the mean efficiency ratios for the whole 2004-2012 period, the regions achieving the highest values are the inland regions of Madrid, Extremadura, Aragón and Rioja, together with the regions of Asturias and Cantabria on the north coast. By contrast, it can be said that the least efficient regions are those covering the whole of the Mediterranean arc, stretching from Catalonia down to Andalusia. These are regions in which beach tourism predominates and, surprisingly, despite monopolizing much of the domestic cultural tourism, they do not prove as efficient as expected, taking into account the resources they have available. The same might be said of the remaining Cantabrian regions (Galicia, Basque Country and Navarre) in which, even though cultural tourism accounts for a major part of their tourist sector, they achieve relatively low and below national average levels of efficiency. The other inland regions (Castilla y León and Castilla La Mancha) remain stable, with efficiency levels around the national average. Figure 6 displays the evolution of the efficiency ranges between 2004 and 2012, with three groups of regions standing out: improving

Table 3. Regional efficiency scores: CRS pool model.

	CRS 04	CRS 06	CRS 08	CRS 10	CRS 12	Mean CRS
Andalusia	45.15	47.49	41.56	42.49	51.21	45.58
Aragon	60.67	71.37	62.24	64.91	67.23	65.28
Asturias	65.08	100	76.12	69.57	87.26	79.61
Balearic Islands	28.45	35.59	58.25	42.18	29.75	38.84
Canary Islands	57.23	45.41	74.24	69.92	28.63	55.09
Cantabria	100	71.44	89.34	92.04	62.41	83.05
Castile and Leon	64.03	58.81	40.37	46.77	53.96	52.79
Castile La Mancha	80.1	46.74	43.64	38.64	51.73	52.17
Catalonia	27.85	31.23	27.52	23.62	24.14	26.87
Valencian Community	42.8	35.87	30.66	29.76	20.51	31.92
Extremadura	100	81.42	66.84	64.32	72.99	77.11
Galicia	50.39	65.99	52.49	50.34	43.15	52.47
Madrid	84.12	100	77.27	91.39	98.23	90.20
Murcia	22.79	28.16	23.82	12.44	15.66	20.57
Navarre	56.23	45.7	26.9	50.72	41.14	44.14
Basque Country	32.66	33.79	20.56	41.16	39.45	33.52
La Rioja	66.06	42.68	57.23	55.62	84.72	61.26
Mean efficiency	57.9	55.4	51.1	52.1	51.3	53.6
Number of efficient regions	1	2	0	0	0	0

Note: CRS: constant returns to scale.
Source: Own elaboration.

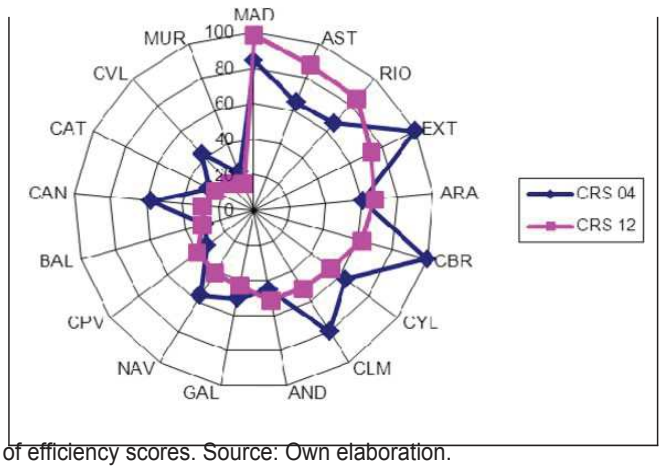

Figure 6. Evolution of efficiency scores. Source: Own elaboration.

regions, whose efficiency has improved, and who occupy the top spots (Madrid, Asturias and La Rioja); losing momentum regions, who have witnessed a significant drop from the high levels of efficiency shown at the start of the period (Extremadura, Cantabria and Castilla La Mancha) and finally delayed regions, who display a low and regular level of efficiency, these being mainly the regions in the Mediterranean arc together with the Basque regions.

Table 4. Possible improvements in achievement of inputs and outputs by region.

Regions	Festivals Gain (%)	Museums Gain (%)	Heritage sites Gain (%)	Cultural employment Gain (%)	Cultural tourism Gain (%)
Andalusia	0.0	-39.3	-18.5	-41.1	120.7
Aragon	0.0	-75.4	-40.0	-48.1	53.7
Asturias	0.0	-28.3	0.0	-24.4	28.7
Balearic Islands	0.0	-72.1	-87.2	-51.5	175.5
Canary Islands	0.0	-49.4	-4.7	-63.1	104.4
Cantabria	-5.5	-2.1	-3.9	-10.4	24.2
Castile and Leon	0.0	-77.0	-14.6	-20.7	94.6
Castile La Mancha	0.0	-84.1	-19.6	-35.6	104.0
Catalonia	-7.6	-3.0	-0.1	-63.8	276.1
Valencian Community	0.0	-24.2	0.0	-46.5	232.4
Extremadura	0.0	-31.4	0.0	-2.4	33.0
Galicia	0.0	-53.2	-2.3	-58.0	94.2
Madrid	-0.1	-15.9	0.0	-9.8	11.9
Murcia	0.0	-81.1	-27.9	-51.4	431.2
Navarre	-14.3	0.0	0.0	-15.0	141.7
Basque Country	-6.8	-5.4	0.0	-2.6	217.0
La Rioja	-4.1	-4.0	0.0	-22.3	71.7

Source: Own elaboration.

One interesting result of DEA analysis is that it allows the necessary adjustments, both in inputs and outputs, to be calculated so as to reach an optimum result, in other words the efficiency frontier. The results of this analysis for the case study in hand are shown in Table 4 reflecting the average improvements which regions need to make for the whole period of time. In other words, we have calculated the mean of the adjustments for each region in each year of reference, since the efficiency analysis was conducted for all the panel data. The results should therefore be taken merely as references of the direction in which improvements towards an optimal situation might be considered. It can thus be seen that the main sources of inefficiency are basically connected with the excessive number of museums and the need for a greater effort in attracting specific cultural tourism in some regions. More specifically, as regards input, we might point to the excessive number of festivals in the Basque regions and Catalonia; too many museums in the two Castillas, Aragón and Murcia; numerous heritage inscriptions in the Balearic Islands and too many people employed in the cultural industry in the Canary Islands, Catalonia and Galicia. Regarding possible improvements in outputs, it can be said that Mediterranean regions need to attract highly significant flows of cultural tourism in general terms.

Analysing determinants of regional efficiency

In the second step of our efficiency analysis, we investigate the impact of environmental variables on the regional destinations' technical efficiency. For this purpose, we perform the second-stage analysis running a regression with the efficiency scores as dependent variables and the external variables as the independent ones. Nevertheless, DEA literature recognizes that the efficiency scores obtained in the first stage might be correlated with each other, since calculating a region's efficiency involves observing all the other regions in the same data set. This problem often results in

Table 5. Boostrap estimation on regional efficiency scores under CRS pool model.

Regions	Mean CRS	Boostrap Mean	Boostrap lower bound	Boostrap upper bound
Andalusia	45.6	38.7	28.4	46.1
Aragon	65.3	61.4	53.7	65.5
Asturias	79.6	73.2	66.5	80.7
Balearic Islands	38.8	36.7	32.5	39.0
Canary Islands	55.1	51.1	44.8	55.6
Cantabria	83.0	71.6	66.1	84.0
Castile and Leon	52.8	44.5	31.6	53.4
Castile La Mancha	52.2	48.1	40.2	52.4
Catalonia	26.9	22.1	13.1	27.2
Valencian	31.9	28.8	24.8	32.4
Extremadura	77.1	66.4	56.9	78.1
Galicia	52.5	47.4	40.5	53.2
Madrid	90.2	82.8	80.4	91.2
Murcia	20.6	19.4	17.0	20.7
Navarre	44.1	38.3	29.1	44.9
Basque Country	33.5	29.1	23.4	34.1
La Rioja	61.3	54.6	44.8	62.4
Mean efficiency	53.6	47.9	40.8	54.2

Note: CRS: constant returns to scale.
Source: Own elaboration.

inconsistent and biased estimates (Simar and Wilson, 2000). Moreover, the DEA efficiency estimate measures performance relative to an estimation of the true and unobservable production frontier and provides point estimates of performance. Since estimates on the frontier are based on finite samples, DEA measures based on these estimates are subject to sampling variation of the frontier. A bootstrap procedure might prove suitable to overcome these problems since it offers some improvements in estimating efficiency scores. Specifically, and regarding our research, we have implemented a bootstrap procedure,[9] with 2000 bootstrap draws, to correct the bias in DEA estimators and to obtain their confidence intervals. Table 5 reports these average values at a regional level for the whole time period. Consequently, bias corrected efficiency scores are chosen as the dependent variables in the regression with a set of explanatory variables which could affect regional efficiency.

As far as independent variables are concerned, we identify a set of explanatory variables which is likely to affect the efficiency of regions as cultural destinations. As mentioned in the methodological section, we first consider indicators of cultural heritage labelling, namely WHL inscriptions, weighted by the accumulated year of nomination which might represent the possible influence of reputation on cultural tourist motivation. Second, we consider variables related with the regional accessibility, such as accommodation facilities in terms of hotels and rural houses, or length of motorways allowing tourists better and faster access. Third, we consider indicators which aim to represent the omnivorous component of tourism, by merging visits to cultural attractions with visits to the beach or natural resources as well as considering the scope of other flows of tourism (other domestic tourists and international tourists) that could eventually engage in cultural activities during their visit. Finally, we consider variables related with the level of regional cultural activities, measured by regional expenditure on culture, the weight of the private cultural sector through the number of cultural enterprises as well as other variables such as those related to safety

Table 6. Environmental factors influencing regional efficiency: Truncated regression.

	Baseline model		Refined model	
Variables	Coefficient	Standard error	Coefficient	Standard error
Constant	0.895*	0.109	0.780*	0.065
WHL-Acc	-0.001**	0.000	-0.002**	0.000
BedsH-Total	-0.142***	0.081	-0.009**	0.004
Beds-345H Stars	0.134	0.084	-	-
Rural-B	0.001	0.001	-	-
Motorways	-0.115*	0.021	-0.098*	0.014
Coast	0.023**	0.010	-	-
Natural Parks	0.003	0.003	0.010*	0.002
Cult-Expenditure	-0.000	0.000	-	-
Cult-Enterprises	0.007*	0.001	0.006*	0.000
Safety	-0.002	0.008	-	-
Trend	-0.011	0.008	-	-
No-Cult Nat Tourism	0.001	0.001	-	-
Internat Cult Tourism	-0.012**	0.003	-0.005*	0.000
Number of observations		85		85
Log L		51.04		46.66
AIC		-0.84		-0.90
BIC		-0.41		-0.67

Note: AIC: Akaike Info Criterion; BIC: Information Criterion Bayesian; WHL: World Heritage List.
Source: Own elaboration.
*Statistically significant at 1% level.
**Statistically significant at 5% level.
***Statistically significant at 10% level.

through the number of thefts and minor offences. We measure all these variables in terms of square kilometres or inhabitants in each region. We have also considered a yearly time trend to take into account possible time effects on regional efficiency.

Following most of the recent applications on performance evaluation of tourist destinations or entities (Assaf and Agbola, 2011; Barros et al., 2011; Benito et al., 2014; Cuccia et al., 2016), we adopt the truncated regression model for a pooled cross-section time-series data set on all Spanish regions. This approach proves more adequate than censored-Tobit or OLS regressions in order to yield consistent estimation of model features. By contrast, Banker and Natarajan (2008) and Chen et al (2014) indicate that two-stage DEA-based procedures with OLS, ML or even Tobit estimation in the second stage are appropriate and significantly outperform parametric methods. We therefore regress the bias corrected efficiency scores under CRS assumption on the previous set of explanatory variables and we estimate two models: the baseline model, with all explanatory variables, and the refined model, dropping some of the variables that appear as non-significant in the analysis and we try to find the best interpretation. Table 6 reports the results from these estimations. We analysed the changes in the value and signs of the parameters as a result of dropping certain variables, results showing that the signs basically do not change and that the values are almost the same, thus reflecting the homoscedasticity of the data. Regression with a truncated model appears to be the best fit for the data, with positive t-statistics, which are statistically significant individually and jointly for all parameters. It also yields acceptable improvements in the goodness of fit criteria.

Regarding the interpretation of the results, we may point to the following. First, there would appear to be an inverse relation between variables of accessibility such as motorways and the density of accommodation supply (number of beds in total hotels) and how efficient regions are in attracting domestic cultural tourism vis-à-vis their available resources. This suggests that national cultural tourists prefer places other than congested regions and mature destinations, mainly identified with the typical sun and beach tourism. This might be the case of the Mediterranean regions, the less efficient ones, which have a greater density of motorways and obviously a more abundant offer of hotels and accommodation, compared to their usual tourist potential. By contrast, the presence and size of natural parks does have a positive impact. This might be indicative of inland regions and the specific cultural tourist flows arriving there who, while maintaining the cultural purpose of the visit, plan the trip taking into account a complementary interest in the countryside and natural attractions which are usually located in less congested regions and unconventional destinations. A further factor which fails to contribute positively, and indeed does quite the opposite, is the presence of official heritage ensembles (WHL), which are likely to have a greater impact among foreign tourists than among domestic tourists. Indeed, it is to be assumed that the main heritage attractions recognized by UNESCO are probably well known to domestic cultural tourists, such that when planning their tourist trips they are likely to seek less established and less congested cultural attractions. By contrast, international tourists seem to select these major cultural icons, which they also combine with sun and sand holiday destinations,[10] such that their presence makes a negative contribution to regional efficiency vis-à-vis attracting domestic cultural tourism. They are in fact two distinct segments of tourism that reflect differing goals and destinations. Finally, one factor which does have a positive impact on the level of efficiency is the number of cultural enterprises per square kilometres, reflecting the importance which should be attached to having a thriving private cultural sector if higher levels of efficiency are to be achieved.

Conclusions

Efficiency of cultural destinations can be measured through the relation between available cultural resources and cultural tourism. An empirical application in Spain was carried out following a two-stage method to evaluate the efficiency of its regions which evidence highly significant independence vis-à-vis managing their own cultural resources. We employ the DEA method to obtain efficiency scores and then estimate the possible influence of a set of environmental variables. Specifically, we take national cultural tourism as the object of our analysis and consider a broad sample of cultural resources which act as a region's main cultural attraction. As external variables which may qualify this relation, we consider indicators representing reputation, accessibility, omnivorous cultural tourism as well as the scope of the regional cultural sector. As regards efficiency outcomes, we find the most efficient regions to be the inland regions together with the central part of the north coast. By contrast, the least efficient regions are those covering the whole of the Mediterranean arc, stretching from Catalonia down to Andalusia, together with the rest of the Cantabrian regions. Among the former are some regions whose efficiency level improves (Madrid, Asturias and Rioja), whereas others have experienced a substantial decline (Extremadura, Cantabria and Castilla La Mancha). As regards environmental determinants of regional efficiency in attracting domestic cultural tourism, it can be said that efficiency is greater in the case of non-congested areas, which differ from the conventional sun and beach tourism, and when offering natural attractions. Nor does heritage labelling reputation prove necessary, whereas efficiency does prove to be related to the existence of a large private cultural sector. This is because the volume of creative industries at a given destination

(i.e. art, crafts, design, fashion, film, music and performing arts) is becoming a major source of attraction for cultural tourists. Finally, the existence of a significant amount of international tourism leads to less regional efficiency in attracting domestic cultural tourism, since they seem to evidence radically different behaviour: the former merging their holiday destinations with visits to well-known cultural attractions, and the latter seeking destinations that are frequented less and not so congested.

In sum, the main conclusion of this study allows us to do more than merely ascertain which factors prove significant in regional performance and to provide us with useful information vis-à-vis the final classification of all Spanish regions which we draw from the analysis. Our findings are useful to both academics and practitioners who seek to understand the factors that drive regional efficiency in attracting specific cultural tourism. In many situations, it may be necessary to assess the relative importance of the external variables so that effective managerial decisions aimed at improving future productivity can be made in a cost-effective manner. Our study sets out the benefits and limitations associated to a two-stage procedure in evaluating regional efficiency and also identifies the influential determinants involved therein. From this standpoint, the results of the research can above all be considered as an important guide for the regional authorities and policymakers in the area of cultural heritage and cultural policy in order to take advantage as much as possible of the benefits in order to attract cultural tourism as a source of economic development.

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Notes

1. For methodological clarifications, see http://www.iet.tourspain.es.
2. Specifically, in the case of Spain, Spanish nationals may travel for the following four reasons: recreational leisure and holidays, business trips, study trips and visiting relatives. Among the first reason given, which in 2012 accounted for 53% of all trips, possible eligible motivations might be countryside and seaside, doing sports, cultural tourism and other kinds of leisure. Single purpose cultural tourism accounted for 10.4% of leisure trips in 2012.
3. cf. http://www.mcu.es/culturabase. The general survey on museums is conducted each 2 years, hence our consideration of only even years for the analysis.
4. There are no data available for foreign tourists classified in terms of the main motive for their visit, there being, at most foreign visitors who during their stay consume culture, even if the reason for their visit is not strictly cultural. Data are not, therefore, comparable nor may be merged into a single study. Yet, given the importance that international tourism might have in the consumption of international resources, they will be duly considered as an external variable in the second stage of the regional efficiency analysis.
5. For technical details on non-parametric data environmental analysis (DEA) method, its advantages and detractors, see Ganley and Cubbin (1992), Fernández-Blanco (2013) and Chen et al. (2014) Furthermore, Banker and Natarajan (2008) show that, under specific conditions, the DEA-based procedure with ordinary least square or Tobit regression estimation in the second-stage outperforms parametric methods and establishes it as a non-parametric stochastic frontier estimation.

6. Constant returns to scale (CRS) measures the overall efficiency for each unit (pure technical efficiency and scale efficiency). Variable returns to scale (VRS) provides measures of pure technical efficiency. Scale efficiency score is obtained by dividing the CRS score by the VRS score (see Ganley and Cubbin, 1992).
7. It should be mentioned that we also worked with variable tourist expenditure as an indicator of output in order to check whether the results might be different or clearer. However, the final efficiency rank of the regions hardly changed.
8. This has also been borne out in a study positing a similar approach carried out for Italian regions (see Cuccia et al., 2016).
9. We employ the smoothed homogeneous bootstrap procedure on the PIM DEA software version 3.2.
10. Indeed, this is borne out in the ad hoc study we conducted on the evaluation of regional efficiency in attracting international tourists. The most efficient regions are restricted to Balearics, Canaries and Catalonia, which are the typical holiday destinations for foreign tourists, together with Madrid, the entry point for international tourists, and home to the country's major cultural institutions. Results are available from the authors upon request.

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CAPÍTULO 2.

Determinantes de la eficiencia en la captación de turismo cultural nacional y extranjero en España: Un análisis regional

ESTUDIOS DE ECONOMÍA APLICADA VOL. 35 - 3 2017 PÁGS. 849 - 872

Determinantes de la eficiencia en la captación de turismo cultural nacional y extranjero en España: Un análisis regional

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RESUMEN

Planteamos un estudio fundamentado en la metodología de evaluación de la eficiencia en dos etapas sobre destinos turísticos, con una aplicación a las regiones españolas y considerando el flujo específico de turistas culturales como principal output a maximizar. El objetivo es contrastar si la concentración de recursos culturales favorece la eficiencia de los destinos turísticos en la atracción de turistas y examinar las posibilidades de intervención y ajuste en este campo. Consideramos dos modelos de estudio según el origen del flujo de turistas, nacionales e internacionales. La metodología consta de un procedimiento en dos etapas, en primer lugar se estiman los ratios de eficiencia por medio de métodos no paramétricos, y posteriormente contrastamos cómo estos ratios pueden verse condicionados por una serie de variables externas de tipo dotacional y cultural, a través de un análisis de regresión.

Palabras clave: Turismo cultural, análisis regional, análisis envolvente de datos, evaluación de la eficiencia en dos etapas.

Drivers of Efficiency in Attracting Domestic and Foreign Cultural Tourism to Spain: A Regional Analysis

ABSTRACT

We posit a study based on the two-step efficiency evaluation method for tourist destinations, applied to Spanish regions and taking into account the specific flow of cultural tourists as the principal output to be maximised. The aim is to ascertain whether the concentration of cultural resources favours the efficiency of tourist destinations when attracting tourists and to explore the possibilities of intervention and adjustment in this field. We put forward two study models depending on whether the origin of the tourist flow is domestic or international. The method consists of a two-step procedure. First, the efficiency ratios are estimated by means of non-parametric methods. We then examine how these ratios might be shaped by a series of endowment and cultural type external variables, applying regression analysis.

Keywords: Cultural Tourism, Regional Analysis, Data Envelopment Analysis, Efficiency Evaluation, Two Stage Procedure.

Clasificación JEL: Z11,018, L83, R38, D24

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1. INTRODUCCIÓN

Medir la competitividad de los destinos turísticos en cuanto a su capacidad para atraer flujos de turistas, supone una línea de investigación reciente en la economía del turismo que sin embargo ha demostrado, a tenor del número creciente de publicaciones en la materia, un interés y resultados notables (Cracolici *et al.,* 2008; Botti *et al.,* 2009, Suzuky *et al.,* 2011). El desarrollo de este campo de trabajo se debe, en buena medida, a que proporciona un mayor conocimiento de la distribución territorial de la industria y la demanda de turismo, así como en el interés de comprobar el resultado de determinadas estrategias de emprendimiento productivo o dotación de recursos turísticos sobre la atracción de mayores flujos de turismo. En nuestro estudio tratamos de acotar el enfoque, ya que no analizamos el sector turístico en su totalidad, sino que vamos a abordar el particular del turismo cultural dentro de las regiones españolas. Existe un importante número de investigaciones que ubican la cultura y el patrimonio dentro de los principales atractivos que determinan las entradas de flujos turísticos (Cuccia y Cellini, 2006; Cuccia *et al.,* 2013). Siguiendo esta línea, tratamos de constatar hasta qué punto la concentración de atractivos culturales puede determinar el grado de eficiencia con el que las regiones son capaces de atraer turistas. El resultado de este trabajo ofrece una herramienta de gestión turística, que contribuye al planteamiento de prácticas más eficientes en relación al uso y manejo de los recursos culturales, entendidos como factores de la atracción turística y en consecuencia del potencial desarrollo económico a escala regional.

Debemos puntualizar que, cuando hablamos de turistas culturales, aludimos a aquellos viajeros que realizan al menos una pernoctación (no se incluye, por tanto, a excursionistas) y que declaran como razón principal de su visita una motivación de carácter cultural. En base a la información disponible el flujo de turistas culturales nacionales, declaran estrictamente una motivación cultural de su viaje, y que representan el 14% del total de turistas nacionales; en tanto que para los turistas de origen internacional se dispone información de aquellos que declaran realizar explícitamente consumos culturales durante su viaje, y que alcanzan el 16.9% del total de turistas extranjeros[1].

Basado en estas premisas, planteamos la realización de un estudio de evaluación de la eficiencia de destinos turísticos en España, tomando las diecisiete Comunidades Autónomas como unidades de análisis, abarcando el lapso temporal 2004-2012, con un enfoque basado en la metodología de análisis de eficiencia en dos etapas (Simar y Wilson, 2000; Daraio y Simar, 2005) En primer lugar se realizará un cómputo de ratios eficiencia por medio del método no

[1] Datos extraídos del Anuario de Estadísticas Culturales (Ministerio de Educación, Cultura y Deporte, 2013).

paramétrico Análisis Envolvente de Datos (DEA), y posteriormente un análisis de regresión, a fin de observar la posible influencia de variables exógenas.

Partimos de una función de producción hipotética, que pone en relación el output medido en términos de flujo turístico de carácter cultural con una serie de inputs. En nuestro caso hemos considerado como factores productivos, recursos culturales que tratan de medir el capital cultural de cada una de las regiones: número de festivales, instituciones museísticas y declaraciones de Bienes de Interés Cultural (BIC). Con ello tratamos de abarcar el amplio abanico de prototipos culturales, integrando variables de patrimonio histórico, artes escénicas y musicales y las principales entidades de gestión del patrimonio cultural, los museos. Además incluimos una variable de factor trabajo como es el empleo cultural. En la denominada segunda etapa, observaremos que la eficiencia puede verse condicionada por una serie de variables externas o de entorno, por medio de la aplicación de un análisis de regresión. Consideraremos para ello la influencia de aquellos factores alusivos a la accesibilidad de las regiones, opciones de ocio alternativas, existencia de recursos de tipo natural, equipamientos hoteleros y alcance del sector en términos de empresas culturales.

Basado en esta metodología en dos etapas, proponemos la estimación de dos modelos. La diferencia entre ambos vendrá dada por el output tenido en consideración: por un lado analizaremos la eficiencia en la captación de flujos turísticos culturales provenientes del propio país, denominados en adelante como turistas culturales nacionales. Por otro lado se realizará una aplicación similar para los turistas culturales cuya procedencia sea internacional, a los que aludiremos como turistas culturales internacionales. Esta estimación se realizará con el objetivo de observar los diferentes patrones de comportamiento de cada uno de los flujos turísticos. La aplicación resulta especialmente oportuna, ya que se debe tener en cuenta que, pese a ser dos flujos bien diferenciados, los recursos culturales desplegados por las regiones, y que se consideran condicionante principal en su atracción, son los mismos para ambos casos, si bien dependiendo de las propias motivaciones, la eficiencia puede verse influenciada por unas u otras variables internas o externas, como trataremos de comprobar en la aplicación metodológica.

El artículo se organiza del siguiente modo. Tras esta introducción, se realiza una breve aproximación bibliográfica al campo de estudio, con una revisión de las publicaciones que acometen aplicaciones similares. Posteriormente se plantea la propuesta metodológica y un breve análisis del campo de estudio. El cuarto apartado trata el estudio empírico basado en la aplicación del análisis de eficiencia en dos etapas. Y para terminar, plantearemos una serie de conclusiones y puntos de discusión.

2. MARCO TEÓRICO COMPARADO

El presente estudio se enmarca dentro de las investigaciones que tienen por objeto el análisis del turismo cultural, analizado bajo el punto de vista de la eficiencia. Contamos con un amplio y contrastado número de ejemplos en torno a la evaluación de servicios públicos dentro de sectores como el educativo, el sanitario o el de la investigación (Urueña y Martín, 2012; Quindós *et al.,* 2005; Castrodeza y Peña, 2002). Por su parte el sector cultural ha ido recibiendo, en este sentido, una mayor atención en los últimos años, si bien aún se encuentra lejos de contar una frecuencia de estudios similar (Fernández Blanco *et al.,* 2013). Contamos con diferentes ejemplos de aplicaciones de la metodología de frontera de producción estocástica por medio de modelos paramétricos, dentro del contexto de la evaluación de instituciones culturales como los museos (Bishop y Brand, 2003) y los teatros, (Zieba, 2013; Last y Wetzel, 2010). Sin embargo, son más frecuentes las aplicaciones con empleo de técnicas no paramétricas, fundamentalmente DEA, siendo los museos el principal objeto de estudio, con ejemplos de estudios en Bélgica (Mairesse y Eeckaut, 2002), Italia (Pignataro, 2002; Basso y Funari, 2004) y España (del Barrio *et al.,* 2009; del Barrio y Herrero, 2014). En cuanto a aplicaciones con modelo en dos etapas, son interesantes los estudios centrados en la evaluación de la eficiencia de las bibliotecas (Vitaliano, 1998; de Witte y Geys, 2011) y agencias de patrimonio para el caso italiano (Finochiaro *et al.,* 2011)

Si acotamos la búsqueda de estudios dentro del particular del turismo, nos encontramos con que en los años más recientes ha sido un terreno de estudio bastante fecundo, que ha dado lugar, incluso, a estudios de síntesis científica sobre esta línea de investigación (Sainaghi, *et al.,* 2017). La eficiencia de las agencias de viajes es una de las unidades de análisis más tenida en cuenta, con ejemplos en el marco español (Fuentes, 2011), Turquía (Köksal y Aksu, 2007) y Portugal (Barros y Matias, 2006). Si bien, es el sector hotelero el que aglutina mayor número de estudios, enfocados desde diferentes perspectivas y con enfoques metodológicos variados, como la metodología de frontera estocástica dentro de la oferta hotelera portuguesa (Barros, 2004 y 2006) y sobre este mismo sector en Italia (Brida *et al.,* 2015), o Eslovenia (Assaf y Cvelbar, 2010). Sin embargo, de nuevo constatamos que la mayoría de los ejemplos son aquellos que usan técnicas no paramétricas para evaluar la eficiencia, principalmente DEA, como es el caso de los hoteles en Reino Unido (Sigala, 2004) o las pousadas en Portugal (Barros, 2005) o en el sector hotelero de las Islas Baleares en España (Riera *et al.,* 2011). Además existen diferentes estudios que avanzan en los modelos de eficiencia condicionada y complementan la metodología DEA, por medio del modelo de regresión Tobit, aplicados al sector hotelero en países como Taiwan o Australia (Shang *et al.,* 2010; Wang, 2006; Assaf y Agbola, 2011).

Por último aludimos a aquellos ejemplos que se ciñen de forma específica al

campo de nuestra aplicación, es decir, la eficiencia de regiones como destinos turísticos. En la mayoría de estos casos se encuentran aplicaciones de metodología en dos etapas, siguiendo la propuesta de Simar y Wilson (2007). Generalmente desarrollan un análisis DEA posteriormente los resultados de la eficiencia son considerados en una regresión a modo de variable dependiente, junto a toda una serie de variables externas o de entorno, para contrastar su efecto condicionante (Dios *et al.,* 2006). En la fase del análisis de eficiencia es bastante habitual considerar una función de producción sencilla que relaciona las pernoctaciones en función la capacidad hotelera y la llegada de flujos turísticos. En la segunda etapa, se tienen en consideración un amplio abanico de variables, como los recursos culturales, seguridad, accesibilidad, etc. (vid. Barros *et al.,* 2011, Botti *et al.,* 2009, Benito *et al.,* 2014). Además existen otra serie de trabajos que proponen, por el contrario, una función de producción más compleja, introduciendo algunas variables, anteriormente consideradas como factores externos, dentro de la propia función de producción (Cracolici *et al.,* 2008 y Suzuky *et al.,* 2011). Este es el ámbito en el que se engloba la presente propuesta. En nuestro caso algunos factores son introducidos como inputs explicativos de la eficiencia técnica, especialmente variables referentes a recursos culturales, que se consideran los principales determinantes de la atracción de este tipo de turismo.

3. METODOLOGÍA Y CASO DE ESTUDIO

Contamos con un importante número de publicaciones que abordan la eficiencia de los destinos turísticos de forma global, es decir, sin realizar acotaciones alrededor de los motivos de los turistas para realizar su viaje. En este trabajo se considera que las diferentes motivaciones del turismo deben ser tenidas en cuenta, ya que al hacerlo pueden variar de forma sustancial los ratios de eficiencia de las regiones observadas, al igual que las conclusiones que de ello pueden extraerse en términos de posibilidades de actuación e intervención sobre los recursos y atractivos turísticos. En consecuencia, este nuevo punto de vista puede arrojar resultados sustancialmente distintos a lo que se ha venido realizando hasta el momento (Benito *et al.,* 2014) No obstante, plantear esta precisión analítica implica desarrollar una función de producción específica y compleja, frente a las que con anterioridad ponían en relación variables puramente de gestión de la industria turística, es decir, pernoctaciones en función de la capacidad hotelera y el flujo de turistas.

En nuestro planteamiento metodológico se introduce, por tanto, una acotación especialmente significativa (Herrero y Gómez, 2017), que es considerar como output de la función de producción el flujo de turistas culturales, mientras que del lado de los inputs se toman en cuenta variables relativas a los recursos culturales disponibles en cada región, principales determinantes de su visita, tratando de optar por las que mejor sinteticen los atractivos culturales de las regiones. En

este sentido hemos seleccionado los siguientes: el número de festivales culturales en el ámbito escénico, musical o cinematográfico, expresión de la actividad artística corriente de cada región; el número de museos, institución por excelencia de gestión del patrimonio cultural; y por último, los bienes declarados Bien de Interés Cultural (BIC), ejemplo de dotaciones de patrimonio histórico con especial notoriedad. Además se incluye como variable representativa del factor trabajo dentro de la función de producción, el número de empleados del sector cultural regional.

En cuanto a la fuente de información, tanto de variables de oferta como de demanda y de actividad, proviene del INE a través de la explotación CulturaBase del Ministerio de Educación, Cultura y Deporte, y las estadísticas propias del Instituto de Estudios Turísticos (FAMILITUR, movimientos turísticos de los españoles, y FRONTUR, movimientos turísticos en fronteras). Cabe destacar que, debido a la diferente naturaleza de los datos, para el caso de los turistas culturales nacionales se consideran aquellos que expresan una motivación específicamente cultural en su desplazamiento, mientras que en el caso de los turistas culturales internacionales se incluyen a todos aquellos que realizan consumos culturales, cualquiera que sea la finalidad de su viaje. Este es el principal motivo por el que ambos datos no pueden unificarse y compararse de forma directa, aunque estén estrictamente ligados pues se vinculan en la afinidad cultural, entendida como motivo exclusivo del viaje en el caso de los turistas nacionales, o como consumo frecuente durante la visita en el caso de los turistas internacionales. Por ello, ambos flujos se analizan de manera diferenciada en nuestro trabajo y se trata de dos estudios paralelos, pero vinculados por afinidad. Se considera por lo tanto sendas matrices muestrales de 5 variables que conforman la función de producción (4 inputs y 1 output) para 17 Comunidades Autónomas durante 5 años del intervalo temporal 2004-2012 y para cada segmento de turistas, nacional o internacional[2]. Trabajamos con datos panel, de modo que cada una de las Comunidades Autónomas en cada año, es considerada como una unidad distinta. De este modo estamos generando dos bases de datos de 425 observaciones para cada tipo de turismo.

La metodología que sustenta nuestro análisis se basa en los modelos de eficiencia condicionada en dos etapas. En una primera fase por medio del DEA, aplicado sobre la función de producción anteriormente definida, para medir el ratio de eficiencia técnica de los destinos de turismo cultural. La metodología DEA es una técnica de programación lineal, que evalúa el nivel de eficiencia de un grupo de unidades de toma de decisión, en nuestro caso regiones, calculando

[2] En cuanto al periodo analizado cabe matizar que incluimos únicamente los años pares, ya que solo para ellos contamos con la serie completa de datos, para todas las variables y todas las regiones. Esta es la razón por la que se ha tomado el periodo completo de análisis, y no se ha considerado una posible división en periodos ajustados al ciclo económico.

una envolvente con las unidades que presentan las mejores prácticas o resultados, así como sus combinaciones lineales, dejando por debajo las unidades ineficientes. Largo se ha estudiado sobre las ventajas de aplicar esta metodología, especialmente útil en la evaluación de la provisión de bienes y recursos culturales (Fernández Blanco *et al.,* 2013) debido a que no requiere indicar la forma específica de la función de producción hipotética, puesto que emplea únicamente la información empírica que conoce, resolviendo un simple problema de optimización. Sin embargo, es importante saber que también presenta varias desventajas, como que debido a su carácter determinístico, considera no eficientes todas aquellas observaciones que se alejen de la frontera eficiente, sin poder atribuirlo a algún otro factor aleatorio que condicione el proceso de producción. Además se revela especialmente importante la selección de unidades analizadas, siendo necesario que éstas muestren una cierta homogeneidad, para evitar que la posible disparidad afecte a las estimaciones (Martínez, 2003). Estas posibles desventajas tratan de solventarse precisamente con un análisis de segunda etapa, donde se estudia el efecto de distintas variables externas sobre la eficiencia de las unidades consideradas a través de un análisis de regresión donde los ratios de eficiencia son la variable dependiente y los factores de entorno sirven como variables explicativas (Banker y Natarajan, 2008)

Otra de las utilidades de la metodología DEA es la detallada información que ofrece de las unidades ineficientes, calculando su ineficiencia relativa como la distancia que las separa hasta la frontera de eficiencia (Álvarez, 2001). A lo que se suma la posibilidad de caracterizar esta ineficiencia, dado que aporta información de las mejoras que estas unidades ineficientes deben acometer para alcanzar la frontera óptima. Es decir, en un modelo orientado al input, obtendremos una medida relativa de la reducción de los mismos que debería acometerse, dado un nivel de output, a fin de alcanzar el óptimo de eficiencia. De igual manera en el caso opuesto, en un modelo con orientación al output, podremos obtener una medida de la potencial mejora que las unidades ineficientes pueden alcanzar en esta variable, según su nivel de input. Será esta segunda orientación la aplicada en el presente trabajo descrito matemáticamente del siguiente modo.

Consideramos n DMU a evaluar. El DEA orientado al output calcula un resultado θ_i para cada una de las DMU, dando solución al programa lineal $i=1,\ldots,n,$ bajo el supuesto de rendimientos a escala constantes (CCR):

$$\begin{aligned} &Max \;\; \lambda\theta_i\omega_i \\ &Sujeto\,a\; x_i - X\lambda \geq 0 \\ &Y\lambda - \omega_i y_i \geq 0 \\ &\lambda \geq 0 \end{aligned} \qquad [1]$$

donde x_i e y_i son respectivamente el input y el output de i DMU; X es la matriz

del input, mientras que Y es la matriz del output, y λ es un vector de $n \times 1$ variables. El modelo [1] puede variarse a fin de considerar rendimientos a escala variables (BCC), si se incluye la restricción de convexidad: $e\lambda=1$. Donde e es un vector con todos sus elementos iguales a 1, lo que incluye la llamada Eficiencia Técnica Pura[3]. Además siguiendo a Simar y Wilson (2000) y con la finalidad de ofrecer una prueba de la robustez de nuestras estimaciones, completamos el modelo por medio del procedimiento Bootstrap con 2.000 iteraciones, para eliminar posibles sesgos, y obtener la varianza y los intervalos de confianza de los índices calculados por el DEA. En cuanto a la segunda etapa[4], una vez se han obtenido los ratios de eficiencia, estos son incluidos como variable dependiente en un análisis de regresión. Las variables explicativas o independientes, son aquellas que representan inputs no controlables, y que inicialmente son excluidos de la primera etapa. Si bien es posible que contribuyan a explicar posibles ineficiencias, no pueden ser incluidas dentro de la función de producción ya que son variables de entorno, no discrecionales, que no forman parte del proceso productivo en sí mismo. Sin embargo no contradice que su incidencia pueda condicionar los resultados y por consiguiente, las conclusiones extraídas. Habitualmente se consideran factores climáticos, geográficos, etc., pero en nuestro estudio vamos a introducir variables de dotaciones, servicios, y de ocio alternativo, que junto a los factores de la primera etapa se detallan en la Tabla 1.

En primer lugar, hemos considerado el número de declaraciones de Patrimonio de la Humanidad por la UNESCO, tratando de captar la posible tendencia de los turistas a viajar a aquellas regiones con elementos patrimoniales de mayor relevancia y popularidad. A la hora de conformar esta variable no solo se tiene en cuenta cada declaración, sino que han sido además ponderadas por el número de años desde su inclusión en la lista de bienes declarados. De esta manera vamos a incorporar a la estimación tanto el número de declaraciones como la antigüedad de las mismas, lo cual puede ir correlacionado con una mayor notoriedad. Por otro lado se ha considerado oportuno incluir toda una serie de variables que aluden al grado de accesibilidad turística de la que goza cada región, tanto en términos de capacidad hotelera (camas en establecimientos hoteleros y en casas rurales) con una diferenciación (3, 4 y 5), como en términos de kilometraje de autopistas en relación al tamaño de la región, ejemplo de acceso rápido y cómodo

[3] El modelo CCR mide la eficiencia global de cada unidad (Eficiencia Técnica Pura y la Eficiencia de Escala), mientras que el modelo BBC estima la medida de la Eficiencia Técnica Pura. Añadir que la estimación de la Eficiencia de Escala puede obtenerse del cociente del resultado del modelo CCR y el del BBC. Para más información al respecto puede consultarse Martínez (2003).

[4] Los principales artículos que han sido referentes en el procedimiento en dos etapas son los realizados por Simar y Wilson (2000 y 2007) y para el caso específico de los destinos culturales Cuccia *et al.* (2013).

a los diferentes ofertas culturales. En tercer lugar abordamos la posible naturaleza omnívora del turista cultural, es decir el consumo de otro tipo de actividades en paralelo a lo propiamente cultural. Esto trata de expresarse por medio de las variables superficie de parques naturales y el kilometraje de costa, entendiendo por lo tanto, que ambos elementos (parques naturales y playas) pueden actuar como factores sustitutivos frente al turismo cultural, o también en algunos casos como bienes complementarios, es decir, turismo omnívoro (Barbieri y Mahoney, 2010). En cuarto lugar se incluyen variables alusivas al alcance del sector cultural a nivel regional. La primera de ellas será el gasto público en cultura que realiza el gobierno autonómico, además del número de empresas culturales asentadas en cada región, representativo del entramado productivo cultural en esta área. Estas variables pueden tener una tendencia expresiva del ciclo económico durante el periodo analizado, sobretodo la primera, gasto público cultural, con una merma significativa en la crisis económica. Las empresas culturales han tenido un comportamiento más sostenido. Por último, incluimos la variable seguridad, que engloba la actividad delictiva en cada región (indicador fruto de la agregación de la cifra de crímenes y de la de robos), posible condicionante para la llegada de turistas.

Tabla 1
Variables y estadísticos descriptivos

	Variable	Descripción	Media	Desv. Est.	Mínimo	Máximo
FUNCIÓN DE PRODUCCIÓN	**Festivales**	Nº de festivales programados en cada CC.AA.	124.1	109.5	21.0	409.0
	Museos	Nº de museos en cada CC.AA.	87.4	59.3	8.0	206.0
	Patrimonio Histórico	Nº de elementos de patrimonio histórico protegidos (BICs) en cada CC.AA.	798.4	835.3	103.0	2890.0
	Empleo Cultural	Nº de empleados en el sector cultural (en miles)	30.0	36.9	3.8	139.1
	Turismo Cultural Nacional	Nº de turistas nacionales que realizan viajes dentro de España con motivación cultural (en miles)	500477,6	381858,2	61500	1795000
	Turismo Cultural Internacional	Nº de turistas internacionales que realizan viajes dentro de España con motivación cultural (en miles)	1748726,47	2360224,53	45200	9776800
VARIABLES EXTERNAS	**Autopistas**	Kilómetros de autopista en cada CC.AA. por 100 km2	4.1	2.5	1.0	12.3
	Seguridad	Nº de robos y delitos en cada CC.AA. por 1000 km2	16.6	17.2	1.2	83.5
	Empresas Culturales	Nº de empresas dedicadas a la cultura en cada CC.AA. por 100 km2	32.6	55.7	2.1	288.9
	Gasto cultural	Gasto cultural del gobierno de cada CC.AA. por 1000 habitantes	42.6	21.4	9.0	126.7
	Costa	Kilómetros de playa en cada CC.AA. por 100 km2	4.4	7.8	0	28.6
	Plazas 345 Estrellas	Nº de camas en hoteles de 3, 4 o 5 estrellas en cada CC.AA. por km2	3.3	6.1	0.1	29.7

Tabla 1 *(Continuación)*
Variables y estadísticos descriptivos

	Variable	Descripción	Media	Desv. Est.	Mínimo	Máximo
VARIABLES EXTERNAS	**Plazas Totales**	Nº de camas disponibles en establecimientos hoteleros en cada CC.AA. por km2	3.6	6.3	0.2	30.6
	Plazas rural	Nº de camas en hoteles rurales en cada CC.AA. por km2	33.9	26.0	1.4	112.3
	Parques naturales	Superficie de los parques naturales en cada CC.AA. por 1000 km2	9.0	12.6	0	44.0
	Tendencia	Factor temporal que indica el caso de los años objeto de la muestra	8	2.84	4	12
	Declaraciones UNESCO	Nº de declaraciones UNESCO, en cada CC.AA. ponderado por años de inscripción	44.7	30.4	6.0	134.0

Fuente: Elaboración propia.

Los resultados de la eficiencia estimados en la primera etapa, se introducen en un análisis de regresión como variable dependiente, y los factores externos como variables independientes, conformando una regresión de datos trasversales especificada de la siguiente manera:

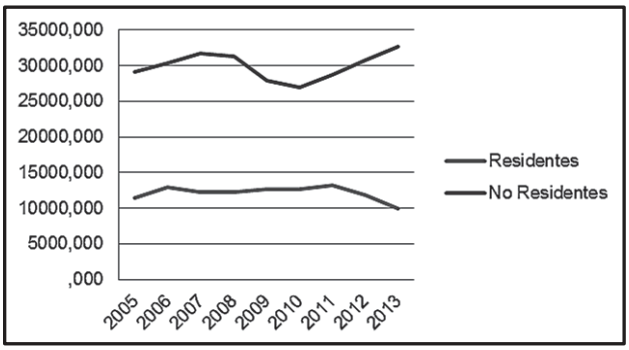
$$\theta_i = f\left(z_i\right) + \varepsilon_i \qquad [2]$$

Donde θ_i representa el índice de eficiencia extraído del DEA, z_i está conformado por las variables ambientales, y ε_i es un vector que recoge el posible error. Para evitar posibles sesgos se aplica la técnica de bootstrapping. Una vez aplicada esta corrección se estima una regresión truncada (Simar y Wilson, 2007; Benito *et al.,* 2014) que nos permitirá observar qué variables determinan la eficiencia de las regiones, en qué medida lo hacen según la interpretación de su coeficiente, y si su efecto condicionante actúa de forma positiva o negativa, dependiendo del signo de ese coeficiente. El análisis en dos etapas permite caracterizar las posibles ineficiencias que puedan ser únicamente fruto del carácter determinístico del DEA, señalando hacia los factores externos que la condicionan.

Como paso previo a la implementación de la metodología, resulta interesante realizar una breve alusión de los datos que vamos a manejar, a modo de contextualización del sector en el que queda inserto el trabajo, la distribución regional del turismo cultural y los recursos culturales. En este sentido, y a la vista de la Figura 1, podemos señalar que la entrada de turistas culturales internacionales, en sintonía con la cifra de turistas generales, se ha visto sensiblemente afectada por la crisis económica de 2008. Sin embargo, una mirada más detallada nos indica que la cifra de turistas nacionales, con motivación estrictamente cultural, ha permanecido relativamente estable en los últimos años, con un efecto retardado de la crisis económica, puesto que se

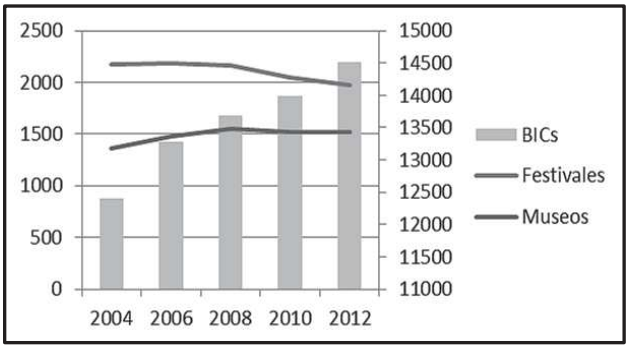
denota un retroceso del flujo a partir de 2011. Por su parte, los turistas internacionales con consumos culturales, sufren un retroceso notable entre 2008 y 2011, para repuntar posteriormente, a ritmo anual importante. Los destinos preferidos por el flujo de turistas son, para el caso del turismo nacional, sobre todo Andalucía, seguida de Cataluña y Castilla y León. En el lado contrario, las regiones menos frecuentadas por los turistas nacionales son Murcia y La Rioja. Entre los turistas de origen internacional, destacan con mayor número de entradas, las regiones de Cataluña, Andalucía y Canarias, mientras que La Rioja y Castilla la Mancha presentan las cifras más bajas.

Figura 1
Evolución de los turistas culturales en España según origen
(En miles)



Fuente: Elaboración propia a través de CULTURAbase.

Figura 2
Evolución de los recursos culturales en España



Fuente: Elaboración propia a través de CULTURAbase.

En cuanto a la evolución de los factores productivos considerados en la función de producción, (Figura 2) solo apuntar que a medida que pasan los años, las cifras tienen a estancarse, sino a retroceder a partir de la crisis económica de

2008 en el número de festivales y museos. No ocurre así en el número de BICs (Bienes de Interés Cultural), que continúa creciendo progresivamente debido, principalmente, a que la declaración de expedientes de BIC no requiere de recursos financieros sino de la simple voluntad institucional de reconocimiento. Resulta interesante, por lo tanto, examinar la evolución de la eficiencia regional en la captación de turismo cultural en estos últimos años de recesión ligera de la demanda y contención de algunos de los elementos de la oferta cultural.

4. APLICACIÓN EMPÍRICA

En primer lugar se acomete la aplicación del DEA, para obtener los resultados de la eficiencia de los destinos en cuanto a la atracción de turistas culturales. Partiendo de la función de producción anteriormente diseñada para cada modelo, formada por inputs comunes de capital cultural (Festivales, Museos, BICs) y de empleo cultural, la diferencia viene dada por el lado de los outputs: en el primer modelo (Modelo A) consideraremos el número de turistas culturales nacionales y en el segundo (Modelo B) los turistas culturales internacionales.

De forma previa a la aplicación, debemos caracterizar el modelo dentro de las diferentes opciones que la metodología permite, adecuándolo a la naturaleza de la muestra, y al tipo de conclusiones que pretendemos extraer. En primer lugar, condicionado por el tamaño de la muestra, realizamos las estimaciones en base a un panel de datos, es decir, todas las regiones son tomadas como unidades distintas en cada año considerado. En cuanto a las especificaciones del propio DEA, y dado el carácter de los recursos y variables con las que vamos a trabajar, hemos optado por el modelo orientado hacia la maximización del output, es decir, que se considerarán eficientes aquellas regiones que, dado un nivel de input (empleo y recursos culturales), alcanzan el máximo output (turistas culturales), siendo las que conformarán la frontera de casos eficientes. Se trata del modelo más habitual dentro de los análisis de eficiencia del sector turístico (Cracolici *et al.,* 2008; Barros *et al.,* 2011) y especialmente en las aplicaciones de eficiencia en dos etapas. En cuanto a la hipótesis técnica, nos inclinamos por el modelo de rendimientos constantes a escala (CCR) ya que nos aporta información de la eficiencia de forma global, suma de la eficiencia técnica y de escala y también es ampliamente utilizado en estos estudios (Cuccia *et al.,* 2013)[5].

Aplicado el DEA sobre los dos modelos A y B, para las 17 Comunidades Autónomas, bajo la hipótesis tecnológica de rendimientos a escala constantes (CCR) y con una orientación a la maximización del output, obtenemos los siguientes resultados. En la Tabla 2 se presentan los porcentajes de eficiencia alcanzados por cada unidad. Apuntar que, a pesar de que la estimación se

[5] No obstante, se ha estimado el modelo bajo el supuesto alternativo BCC, con rendimientos de escala variables, resultando mucho menos restrictivo ya que las unidades consideradas eficientes en el modelo CCR también lo serán en el BCC, pero no al revés.

realiza en base a un panel de datos, con el objetivo de facilitar su comprensión, los resultados se presentan en una estructura longitudinal por años, calculando finalmente la media del periodo.

Tabla 2
Ratio de eficiencia por destinos turísticos culturales 2004-2012

	Modelo A						Modelo B					
	04	06	08	10	12	CCR Medio	04	06	08	10	12	CCR Medio
Andalucía	45,1	47,5	41,6	42,5	51,2	45,6	47,7	43,8	40,4	33,2	37,4	40,5
Aragón	60,7	71,4	62,2	64,9	67,2	65,3	9,5	6,7	7,4	5,1	5,6	6,9
Asturias	65,1	100	76,1	69,6	87,3	79,6	8,4	8,1	5,9	6,1	7,3	7,2
Islas Baleares	28,4	35,6	58,2	42,2	29,7	38,8	100	97,3	97,4	89,3	100	96,8
Islas Canarias	57,2	45,4	74,2	69,9	28,6	55,1	100	100	100	80,9	100	96,2
Cantabria	100	71,4	89,3	92,0	62,4	83,0	30,1	25,0	27,3	23,7	20,5	25,3
Castilla y León	64,0	58,8	40,4	46,8	53,9	52,8	16,0	13,7	10,2	6,6	9,4	11,2
Castilla la Mancha	80,1	46,7	43,6	38,6	51,7	52,2	4,8	3,8	3,1	2,2	2,9	3,3
Cataluña	27,8	31,2	27,5	23,6	24,1	26,9	96,2	94,3	98,1	81,7	100	94,1
C. Valenciana	42,8	35,9	30,7	29,8	20,5	31,9	26,5	25,9	26,5	22,8	22,9	24,9
Extremadura	100	81,4	66,8	64,3	72,9	77,1	15,3	12,1	9,8	7,1	7,9	10,5
Galicia	50,4	65,9	52,5	50,3	43,1	52,5	18,4	17,4	12,4	7,6	8,5	12,8
Madrid	84,1	100	77,3	91,4	98,2	90,2	66,7	71,9	85,5	93,4	92,5	82,0
Murcia	22,8	28,2	23,8	12,4	15,7	20,6	11,9	11,7	11,3	11,3	8,3	10,9
Navarra	56,23	45,7	26,9	50,7	41,1	44,14	8,7	6,2	7,5	16,3	13,1	10,4
País Vasco	32,7	33,8	20,56	41,2	39,4	33,52	18,1	19,2	16,3	14,7	19,7	17,6
La Rioja	66,1	42,7	57,23	55,6	84,7	61,3	12,1	9,4	7,7	5,1	4,9	7,8
Eficiencia media	57,9	55,4	51,1	52,1	51,3	53,6	34,7	33,3	33,3	29,8	32,9	32,8
Regiones eficientes	2	2	0	0	0	0	2	1	1	0	3	0

Fuente: Elaboración propia.

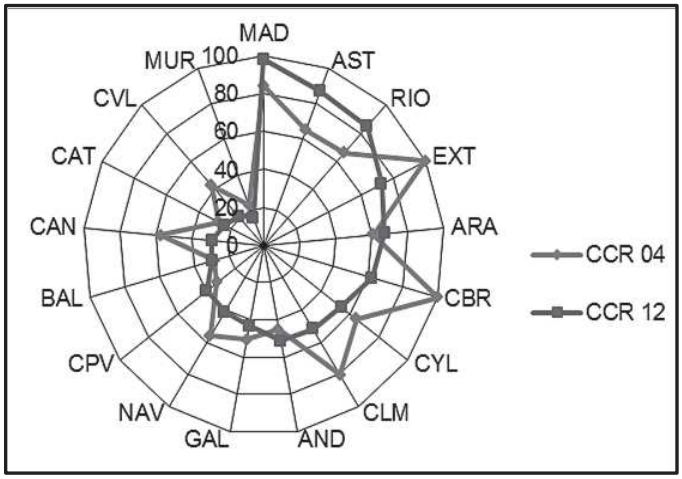
En el modelo A (turismo cultural nacional), observamos que la media de eficiencia a lo largo del periodo para todas las comunidades autónomas, es del 53,6%, lo que nos indica que existe un margen de mejora, en cuando a la maximización del output, de 46,4 puntos porcentuales, dado el nivel de input considerado. La eficiencia media ha decaído de manera significativa hasta un curso más o menos constante al final del periodo. En el primer año analizado, 2004, tan solo dos Comunidades Autónomas son eficientes, Cantabria y Extremadura, dos regiones no especialmente turísticas y en ambos casos periféricas. La primera de ellas de la costa norte y la segunda de interior. En el año 2006 de nuevo son dos, pero en este caso Asturias en el Cantábrico y Madrid como región interior. Madrid es la capital del país, con una acumulación muy importante de instituciones culturales de rango nacional y enorme relieve, además de poseer el aeropuerto más importante y principal entrada de turistas (especialmente significativo a nivel internacional). Ambos años son los que muestran una eficiencia media más alta, en comparación a los años siguientes,

donde no solo la eficiencia media es inferior, sino que además ninguna región se encuentra sobre la frontera de eficiencia, denotando el posible efecto de la crisis económica. Si realizamos una observación general del periodo, podemos ver que las regiones que muestran un mayor ratio de eficiencia son las denominadas "regiones de interior", Extremadura, Madrid, Aragón y La Rioja, a las que se suman dos regiones del litoral, Asturias y Cantabria, ambas de la costa norte. Este resultado comienza a apuntar hacia las características del turismo cultural que desarrollan los turistas nacionales, entre los que los consumos combinados de cultura y costa no parecen estar relacionados. Para el caso de las dos regiones de la costa del norte con un ratio de eficiencia alto, es importante caracterizar este tipo de atractivo turístico. En líneas generales muestra un patrón de consumo turístico menos masivo, condicionado por el un clima menos amable y la propia tipología de las playas, más abruptas y de acceso complicado. Las regiones con mayor margen de mejora, es decir las menos eficientes en la atracción de turistas nacionales específicamente culturales, son las de la zona del arco Mediterráneo (Cataluña, Comunidad Valenciana, Murcia y Andalucía) en contra de lo que se podría esperar a priori, dado que alguna de estas regiones aglutinan un importante porcentaje del flujo turístico cultural nacional. No obtienen un ratio de eficiencia elevado, con respecto a su nivel de recursos culturales y empleo cultural, lo que denota una cierta sobredimensión. La Figura 3 ofrece una clara imagen de la evolución de la eficiencia de las regiones del Modelo A, entre 2004 y 2012. Por un lado observamos cómo hay una serie de regiones que mejoran su ratio de eficiencia, aun cuando ya se situaban en las mejores posiciones al inicio del periodo, Madrid, La Rioja, Asturias y Aragón. El segundo lugar encontramos un grupo de regiones, Castilla la Mancha, Cantabria y Extremadura, que acusan una importante caída al final del periodo aunque se mantienen en las cifras de eficiencia media nacional. Por su parte, las regiones más retrasadas al inicio de este, se mantienen en las últimas posiciones con ratios estables, siendo estas las regiones del Arco Mediterráneo, País Vasco y Baleares.

En el modelo B (turismo cultural internacional), encontramos una situación completamente diferente. En líneas generales las posiciones se alteran, las regiones con mayor ratio de eficiencia son Cataluña y ambas regiones insulares, Baleares y Canarias, siendo estas dos últimas las únicas que alcanzan el óptimo de eficiencia. Todas ellas con un importante turismo de sol y playa, condicionado por el buen clima y el tipo de playas, que contribuye a su notoriedad internacional y las sitúa como destino preferente del turismo internacional. El resto de Comunidades Autónomas se sitúan muy por debajo de las anteriormente mencionadas, con ratios de eficiencia inferiores al 50%, exceptuando la Comunidad de Madrid, en torno al 66%. Esto hace que la eficiencia media acumulada del periodo sea considerablemente inferior con respecto a la del modelo A, alcanzando tan solo un 32,8%, con un margen de mejora por lo tanto del 67,2 puntos porcentuales. Esto evidencia la orientación general del flujo de

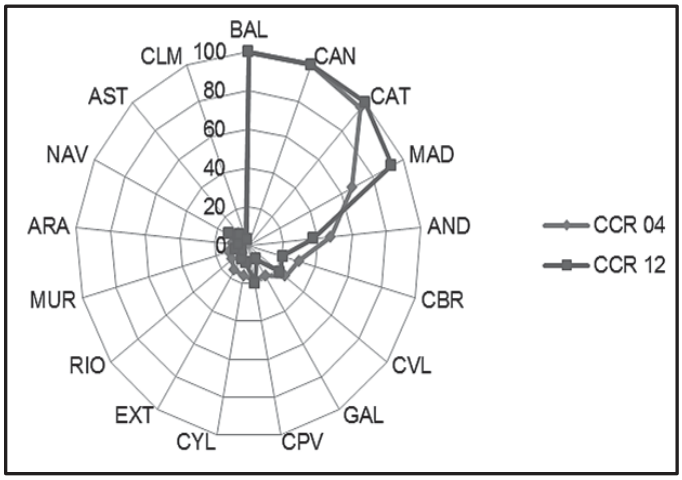
turistas extranjeros, la mayor parte de estos se dirige a estas tres Comunidades Autónomas, que a su vez son un buen ejemplo del carácter omnívoro de este tipo de turismo, dado que se intuye la posible tendencia a combinar la motivación cultural con otros consumos relacionados, por ejemplo el turismo de sol y playa. Trataremos a continuación, dentro del análisis de segunda etapa, de refrendar esta afirmación incluyendo variables alusivas a ese tipo de ocio alternativo o complementario. Si nos detenemos en analizar la evolución de la eficiencia entre ambos extremos del periodo, vemos en la Figura 4 que en el año 2012 se mantiene un panorama similar, con el espectacular aumento de la eficiencia de la Comunidad de Madrid que se sitúa muy cerca de la frontera óptima. En sintonía con en el anterior modelo, se percibe el efecto de la capitalidad de esta región, principal entrada de turistas por vía aérea, presencia de las dotaciones e instituciones culturales con mayor proyección internacional (Museo del Prado, Reina Sofía, etc.) Desarrollan unas prácticas eficientes de nuevo las Comunidades de Baleares, Canarias, sumándose ahora también la Comunidad de Cataluña, región con una notoriedad internacional muy elevada, protagonizada por su capital, Barcelona. El resto de regiones no solo se mantienen retrasadas con respecto a las unidades eficientes, si no que las diferencias, de forma general, tienen a presentar un sustancial aumento, ya que su porcentaje de eficiencia tiende a verse reducido. Destacan los ratios de eficiencia inferiores al 10% de regiones como Castilla la Mancha, La Rioja, Aragón y Asturias, fundamentalmente regiones de interior y con menor notoriedad a nivel internacional.

Figura 3
Modelo A. Turismo Cultural Nacional. Evolución de los ratios de eficiencia 2004-2012



Fuente: Elaboración propia.

Figura 4
Modelo B. Turismo Cultural Internacional. Evolución de los ratios de eficiencia 2004-2012



Fuente: Elaboración propia.

Una de las principales aplicaciones del DEA es la posibilidad de obtener información del margen de mejoras posibles de cada DMU, en cada uno de sus inputs y output, a fin de alcanzar la frontera óptima de eficiencia. Podemos ver en la Tabla 3 una medida del porcentaje de mejora estimado. Debido a la orientación hacia la maximización del output, los resultados expresan ajustes necesarios en los factores productivos o aumento pertinente del output, en nuestro caso la entrada de turistas culturales. Mostramos datos medios para todo el periodo analizado, extraídos a partir de las cifras de cada Comunidad Autónoma en cada uno de los 5 años para los que tenemos información. En líneas generales vemos que, para el Modelo A (Tabla 3), las mayores posibilidades de mejora se centran en los museos, donde se manifiesta una cierta sobredimensión en su dotación, para la capacidad de atracción de turismo cultural, que en los casos de Murcia o Castilla la Mancha se estima en un 80%. De igual modo observamos una cierta sobredimensión en la variable empleo cultural, que aún con porcentajes menores, manifiesta unos ajustes en ocasiones superiores al 50% en determinadas regiones. En cuanto al output, se hace perfectamente patente la necesidad de acrecentar los esfuerzos por parte de todas las Comunidades Autónomas para atraer mayor número de turistas culturales de origen nacional aunque destacan en este sentido las Comunidades del Arco Mediterráneo, como Murcia, donde se debería aumentar el output en más de un 400% dado el nivel de inputs que presenta, seguida de Cataluña y Comunidad Valenciana, ambas por encima del 200%.

Tabla 3
Porcentaje de mejora en la gestión de inputs y outputs por regiones
(Datos Medios)

	MODELO A					MODELO B				
	Festivales	Museos	BICs	Empleo	Turismo Nacional Cultural	Festivales	Museos	BICs	Empleo	Turismo Internacional Cultural
	%	%	%	%	%	%	%	%	%	%
Andalucía	0	-39,3	-18,5	-40,6	120,7	-40,8	-0,1	0	0	150,8
Aragón	0	-75,4	-39,9	-47,7	53,7	-20,9	-32,1	0	0	1424,6
Asturias	0	-28,3	0	-24,2	28,7	-42,4	-28,1	0	0	1322,4
Islas Baleares	0	-72,1	-87,2	-51,1	175,5	0	-0,0	0	-4,2	3,5
Islas Canarias	0	-49,4	-4,7	-62,9	104,4	0	-2,3	0	0	4,7
Cantabria	-5,57	-2,1	-3,9	-10,2	24,2	-59,9	0	0	0	301,3
Castilla y León	0	-76,9	-14,5	-19,9	94,6	-47,3	-58,4	0	0	883,7
Castilla la Mancha	0	-84,1	-19,6	-35,0	104,0	-37,2	-65,5	0	0	3091,1
Cataluña	-7,62	-3,0	-0,1	-63,5	276,1	-17,3	0	-3,6	-24,1	6,9
C. Valenciana	0	-24,2	0	-46,4	232,4	-27,7	-10,4	0	0	303,3
Extremadura	0	-31,4	0	-2,3	32,9	-62,8	-65,1	0	0	929,9
Galicia	0	-53,2	-2,3	-57,7	94,2	-22,3	0	0	0	784,3
Madrid	-0,14	-15,9	0	-9,8	11,9	-78,6	-47,4	0	-84,3	24,2
Murcia	0	-81,1	-27,8	-51,0	431,2	-18,1	-46,3	0	0	833,1
Navarra	-14,35	0	0	-14,9	141,7	-46,4	-0,5	-1,7	-3,4	991,6
País Vasco	-6,85	-5,4	0	-2,5	216,9	-49,9	-9,8	0	-23,3	475,3
La Rioja	-4,06	-4	0	-22,3	71,6	-44,9	0	0	0	1335,7

Fuente: Elaboración propia.

En el Modelo B de nuevo vemos una imagen ciertamente diferenciada respecto al anterior modelo, que ya ocurría en la estimación de los ratios de eficiencia. En primer lugar en cuanto a las mejoras en los inputs, observamos que en este caso el mayor margen de mejora se encuentra en el número de festivales culturales, muy sobredimensionado para el número de turistas internacionales que llegan a estas regiones. Este no parece ser un recurso cultural especialmente atractivo a la hora de atraer turistas extranjeros. En el caso de los museos vemos una situación comparable a lo que mostraban los datos del Modelo A, un número de museos elevado para el nivel de entrada de turistas culturales internacionales. Sin embargo, el número de BICs y el de empleo cultural parecen bastante ajustados al óptimo, en la gran mayoría de regiones. Del lado del output, encontramos que los esfuerzos de mejora deben realizarse especialmente en las regiones del interior, destacando Aragón, La Rioja y Asturias.

Una vez obtenidos los ratios de eficiencia, procedemos en la segunda etapa de evaluación a aplicar el modelo de regresión censurada entre dichos ratios y una serie de variables de entorno, fundamentalmente referidas a condiciones de accesibilidad, recursos complementarios de carácter cultural o natural, capacidad

hotelera y otros. Es importante considerar que la literatura sobre DEA manifiesta la posibilidad de que las relaciones de eficiencia obtenidas durante la primera etapa pueden estar correlacionadas con las variables explicativas utilizadas durante la segunda etapa, lo que puede conducir a estimaciones sesgadas (Simar y Wilson, 2000). El uso de un procedimiento bootstrap puede ayudar a superar este problema ya que ofrece ciertas mejoras en la estimación. Es por ello que realizamos un proceso de bootstraping con 2000 iteraciones, generando una variable que será la que se incluya como dependiente en el análisis de regresión.

Mostraremos dos resultados para cada tipo de análisis: modelo básico que incluye todas las variables externas consideradas, y modelo depurado que elimina aquellas que carecen de significación estadística según la estimación. Los resultados se muestran en la Tabla 4. Analizamos también los cambios en el signo y el valor de los coeficientes cuando se eliminan ciertas variables del modelo y obtenemos como resultado que éstos apenas varían, lo que nos habla de la homoscedasticidad de los datos.

Tabla 4
Factores externos que influyen en la eficiencia de las regiones. Regresión Censurada

	Modelo A (Turismo Cultural Nacional)				Modelo B (Turismo Cultural Internacional)			
Variables	Modelo Básico		Modelo Refinado		Modelo Básico		Modelo Refinado	
	Coeficiente	Error Est.	Coeficiente	Error Est.	Coeficiente	Error Est.	Coeficiente	Error Est.
Constante	0.954*	0.118	0.834*	0.082	-0.833***	0.480	-1.06*	0.040
Declaraciones UNESCO	0.002*	0.000	-0.002*	0.000	-0.000	0.002	–	–
Plazas Totales	-0.062	0.090	–	–	-0.668*	0.258	-0.628*	0.239
Plazas 345	0.056	0.093	-0.009***	0.005	0.676**	0.268	0.631**	0.245
Plazas rural	0.000	0.001	–	–	0.001	0.003	–	–
Autopistas	-0.077*	0.018	-0.080*	0.015	0.259*	0.075	0.270*	0.072
Costa	-0.015*	0.003	-0.015*	0.003	0.029**	0.012	0.030*	0.008
Parques Naturales	0.011*	0.003	0.012*	0.002	0.027**	0.011	0.027*	0.006
Gasto Cultural	-0.001	0.001	–	–	-0.003	0.004	–	–
Empresas Culturales	0.004*	0.000	0.004*	0.000	-0.012*	0.004	-0.012*	0.004
Seguridad	-0.015***	0.008	-0.011***	0.006	0.052**	0.026	0.056**	0.024
Tendencia	0.000	0.007	–	–	-0.062**	0.027	-0.059*	0.023
Nº de observaciones	85		85		85		85	
Log L	44.26		43.22		67.18		66.78	
AIC	-0.73		-0.80		-1.27		-1.33	
BIC	-0.36		-0.54		-0.90		-1.04	

*Nota: *Significación estadística al 1%; ** Significación estadística al 5%; *** Significación estadística al 10%.*

Fuente: Elaboración propia.

Una vez implementado el modelo, podemos concluir cuáles de las variables exógenas tenidas en cuenta afectan a la eficiencia de los destinos turísticos, así como la medida en que lo condicionan y su sentido, ya sea positivo o negativo. En el denominado Modelo A atendiendo al resultado depurado, observamos que existe una relación inversa de la eficiencia regional en atraer turistas culturales nacionales frente a las variables de accesibilidad, capacidad hotelera y costa. Esto puede interpretarse en el sentido de que el turista cultural nacional se distancia de los destinos congestionados, las zonas identificadas con el turismo denominado de sol y playa y de alta densidad turística, ejemplificado por aquellas regiones que conforman el arco mediterráneo, que son efectivamente poco eficientes en la primera etapa. En este mismo sentido planteamos la interpretación de la variable declaraciones UNESCO, con coeficiente negativo de igual manera, que podría reforzar la idea de que el turista cultural nacional evita, en sus desplazamientos vacacionales, los espacios especialmente notorios y de turismo masivo o bien porque quizás ya conoce los enclaves patrimoniales de más relieve. En cuanto a variables que afectan de forma positiva a la eficiencia, encontramos los parques naturales, que pueden considerarse como un complemento para los turistas nacionales con motivación cultural. Por su parte la variable seguridad también significativa en el modelo refinado, muestra un coeficiente negativo, lo que viene a reafirmar de alguna manera lo anteriormente indicado, el turista nacional evita las zonas típicamente turistas que a la vez son algunas de las que poseen mayor índice de delincuencia. Finalmente la variable empresas culturales obtiene un coeficiente significativo y positivo, lo que indica el alcance que el entramado empresarial cultural, es decir el sector privado, tiene a la hora de incrementar la eficiencia de los destinos turísticos.

En el Modelo B (turismo cultural internacional) observamos un escenario donde los signos de los coeficientes de un buen número de variables son inversos a los anteriormente interpretados. Si de nuevo atendemos al modelo final refinado advertimos que, frente a lo que ocurría en el Modelo A, la variable autopistas en este caso presenta un signo positivo, es decir que los turistas internacionales buscan regiones con mejores y más fáciles accesos. Además observamos un carácter omnívoro en la motivación de la elección de destino por parte de estos turistas, ya que les condiciona de forma positiva la presencia de litoral y de parques naturales. Esto constata que, aunque practican una intencionalidad de participación cultural en su visita turística, realizan otro tipo actividades de ocio alternativas. Interesante es la significatividad de la variable seguridad, en el caso de los turistas internacionales, no solo afecta, sino que lo hace de forma positiva. En un primer momento podía parecer contradictorio, sin embargo hemos interpretado este signo como una relación entre la existencia de delitos y las zonas de mayor concentración turística. En cuanto a coeficientes negativos a la hora de atraer turistas internacionales, nos encontramos con la variable tendencia, que nos habla del paso del tiempo en el

modelo analizado. Podemos entender que este coeficiente significativo y negativo, es la manifestación de un proceso de maduración de los destinos turísticos acreditados, a medida que pasa el tiempo estos se vuelven menos eficientes. Por otro lado analizamos de forma conjunta las variables plazas totales y plazas 3, 4 y 5 estrellas. En el caso de la primera su signo es negativo, mientras que la segunda es positiva. Esto indica que los turistas de origen internacional acuden a aquellas regiones donde la disponibilidad de plazas hoteleras en establecimiento de mayor categoría es más abundante, mientras que si en la variable incluimos los hoteles de 2 y 1 estrellas, el coeficiente pasa a ser negativo. En último lugar, la presencia de empresas culturales influye de forma negativa para la asistencia de turistas internacional, esto nos hace pensar en que es un turismo más ligado a turoperadores, donde se realiza la contratación de una oferta completa, no haciendo especial uso de la infraestructura privada de servicios culturales en las regiones que visitan.

5. CONCLUSIONES

Hemos constatado que es posible realizar un estudio que mide la eficiencia de los destinos regionales de turismo cultural, así como los determinantes de la misma, por medio de un análisis de eficiencia en dos etapas (DEA y modelo de regresión censurada). Se han aplicado sobre el contexto de las regiones españolas dos modelos, cuya principal diferencia radica en el output de la función de producción diseñada; el modelo A, analiza la eficiencia de los destinos en la captación de turismo cultural nacional y el modelo B aborda el supuesto del turismo cultural internacional. Se consideran a modo de factores productivos las diferentes dotaciones en capital cultural, y el factor trabajo propio del sector cultural. De la aplicación del análisis DEA se han obtenido los ratios de eficiencia para cada modelo.

Tras observar qué regiones son eficientes, podemos concluir que existe una tendencia inversa en la eficiencia de los destinos turísticos, si se tiene en cuenta el origen de los turistas. Mientras que las regiones más eficientes para el turismo cultural nacional son las de interior y ciertos casos de la costa cantábrica, en el caso del turismo internacional destacan por su nivel de eficiencia regiones del litoral, especialmente del Mediterráneo y las insulares, aquellas con una acreditación turística más elevada. Posteriormente estos ratios han sido introducidos como variable dependiente en un análisis de regresión censurada, a fin de contrastar qué variables externas, es decir no controlables, afectan a su eficiencia. Consideramos como variables exógenas las representativas de la accesibilidad, dotaciones hoteleras, alternativas de ocio, y la existencia de litoral y parques naturales y la presencia de un mayor entramado de empresas dedicadas al sector. De todo ello hemos podido extraer que pese a desplegar los mismos recursos, los destinos turísticos muestran un nivel de eficiencia diferente,

dependiendo del origen de los turistas. En líneas generales los destinos que atraen con mayor eficiencia a los turistas internacionales, ponen de manifiesto un mayor margen de mejora en la atracción de turistas nacionales y viceversa. Esto nos habla de dos segmentos de turismo distintos, el turista internacional muestra un patrón omnívoro, pues aunque realice consumos culturales y así lo declara, se ve atraído por la presencia de costa y parques naturales y se dirige a las regiones de mayor congestión turística en general. Sin embargo los turistas culturales nacionales presentan como determinantes los recursos naturales y muestran un claro sentido opuesto a la presencia de masificación turística, para este flujo se muestran más eficientes las regiones del interior y algunas del Cantábrico. Los resultados parecen estar reflejando la diversificación de viajes que realizan los turistas culturales nacionales. Estos plantean diferentes viajes uni-propósito según su motivación, cultural o no cultural, no combinando ambos motivos en una única salida. Por su parte, los turistas internacionales, trataran de combinar ambas tendencias en un único viaje, algo que resulta obvio teniendo en cuenta el mayor esfuerzo económico requerido y la multiplicidad de destinos alternativos.

Consideramos que las conclusiones extraídas del presente estudio pueden tener una aplicabilidad relevante dentro del sector de las políticas turísticas y culturales. De la discusión aquí generada pueden derivarse toda una serie de herramientas con utilidad en el proceso de toma de decisiones, dentro de la rama de la gestión cultural y turística. La principal utilidad vendrá dada en tanto que se han focalizado los factores y recursos regionales a los que se debe atender en mayor medida, si lo que se pretende es incrementar el volumen de entrada de turistas culturales. Por otro lado debe señalarse también que de este tipo de análisis podemos extraer un mejor conocimiento sobre la distribución a nivel regional de la oferta y demanda turística con naturaleza cultural en nuestro país. Finalmente nos permite comprobar el desempeño del esfuerzo realizado, a nivel público, en la creación de dotaciones culturales y otros recursos turísticos relacionados, en términos de resultados sobre entradas de flujos turísticos de rango nacional o internacional.

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CAPÍTULO 3.

Analysing how cultural factors influence the efficiency of tourist destinations in Chile

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RESEARCH ARTICLE

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Analysing how cultural factors influence the efficiency of tourist destinations in Chile

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Abstract

The present work is framed within the line of research addressing efficiency evaluation of tourist destinations, where regions are taken as territorial units able to determine their tourist appeal, and tourist flow is taken as the variable to be optimized. A virtual production function is therefore devise considering tourist flows as output and accommodation capacity and other tourist and cultural resources as the main inputs. We examine Chile as case study, a country with a growing number or tourists and increased investment in tourist and cultural infrastructures. We follow a two-stage model, estimating regional performance using data envelopment analysis and analysing the impact of external variables on efficiency applying bootstrap techniques and truncated regression models. Empirical results show that cultural endowments and activities together with natural resources determine Chilean regional efficiency in optimizing tourist flow, particularly in attracting international tourism. Thus, policy recommendations to improve regional management of tourist and cultural attractions are derived. This study contributes to increase applications in tourist destinations efficiency in Latin America, where works are still scarce.

KEYWORDS

Chile, cultural tourism, data envelopment analysis, efficiency evaluation, regions, tourist destinations

1 | INTRODUCTION

The analysis of tourist destination competitiveness is an increasingly widespread topic in the field of tourism economics, because it provides both deeper insights into the territorial distribution of industry and tourist flows and because it enables an evaluation of the medium-term performance of entrepreneurship production strategies or the provision of tourist resources vis-à-vis attracting flows of visitors to given sites and geographical areas. The analysis of tourist destination efficiency adopts a range of approaches. On the one hand, some studies address strictly territorial references (Botti, Peypoch, Robinot, & Solonandrasana, 2009; Cracolici, Nijkamp, & Rietveld, 2008; Herrero-Prieto & Gómez-Vega, 2017). These posit a virtual production function for a hypothetical spatial entity, normally the regions within a country, and involve handling various tourist as well as other resources, with a view to maximizing the appeal of tourist flow demand, which is taken as basic output. Other studies seek to gauge the efficiency of certain production systems, usually hotel chains and the tourist industry, with a territorial specification. Here, a more managerial production function is applied, because they merge various capital and work factor inputs attributable to the sector in an effort to optimize monetary type variables, such as sales, revenue, or share of the tourism market (see Assaf & Cvelbar, 2010; Barros, 2005; Brida, Deidda, Garrido, & Pulina, 2015). Likewise, and as regards the methodological approach adopted in such studies, many evaluate efficiency by applying parametric stochastic frontier estimation methods (Barros, 2004; Shang, Wang, & Hung, 2010), although most employ non-parametric optimization techniques, usually data envelopment analysis (DEA), to calculate the efficiency ratios of decision making units, whether these be spatial entities (Barros et al., 2011) or the tourist industry (Köksal & Aksu, 2007). Following the increasingly well-known approach of using two-stage conditioned efficiency models (Daraio & Simar, 2005), such studies also analyse the impact of nondiscretional external variables on the efficiency ranges obtained by said regions or production systems. Examples include the works of Benito, Solana, and López (2014) and Assaf and Agbola (2011), respectively.

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This array of different external variables that might impact on the efficiency of regions or the hospitality sector when attracting tourism usually tends to include capital cultural indicators, either as endowments of historical heritage resources or as variables reflecting the level of activity and cultural participation. In this regard, it is clear that culture and the quality of historical heritage determine part of the tourist flow and individuals' preferences when planning their trip (Cuccia & Cellini, 2007), either as the specific goal of their visit (Guccio, Lissi, Mignosa, & Rizzo, 2017) or as part of the activities to be carried out during the stay, even this does not have a specific cultural finality in itself, making up what is referred to as omnivorous tourism (Barbieri & Mahoney, 2010). For this reason, and in the domain of efficiency studies of tourist destinations, works focusing on specifically gauging the impact of these cultural variables are becoming increasingly common. Such is the case of the study by Cuccia, Guccio, and Rizzo (2016), who focus particularly on ascertaining whether or not UNESCO nominations determine tourist flows travelling to Italian regions, or the study by Herrero-Prieto and Gómez-Vega (2017), which evaluates how efficient Spanish regions are at attracting cultural tourism, as a specific part of global tourism.

Based on these premises, the present work is framed within the stream of research exploring the efficiency of tourist destinations, taking the case of Chile as the model for analysis. In this particular instance, we take the regions as territorial units able to decide their own tourist attractions, and tourist flows as the variable to be optimized given said resources. In the context of Latin America, Chile has begun to see tourism as a strategic economic sector for the country's development (Riquelme, Szmulewicz, & Yañez, 2010) as well as a means of preserving the environment, cultural heritage, and cultural identity (Gale, Bosak, & Caplins, 2013), and as a sector that can act as a spur to other activities (Pearce et al., 2016). The tourist industry in Chile displays tremendous growth potential, both in terms of the scale of domestic demand resulting from the sustained growth in per capita rent over the last few years and its position at an international level,[1] based mainly on its wealth of natural landscapes, but also on its cultural heritage in the broadest sense. This has run parallel to the modernisation and expansion of its tourist infrastructure with regard to the availability of accommodation and catering facilities coupled with wider ranging initiatives and a substantial rise in new tourist and cultural attractions (González & Rivas, 2008).

Given such a context, the present research basically pursues two goals: first, to evaluate the results of regions in Chile vis-à-vis their ability to attract the tourist flows between 2009 and 2014, both domestic and international tourists; and second, to determine which external factors might account for levels of efficiency at a regional scale, focusing particular attention on exploring variables related to cultural heritage and the creative activities sector in the line of the studies mentioned above. In order to achieve these goals, a two-stage efficiency evaluation model is applied. At the first stage, non-parametric DEA is employed to determine indicators of regional efficiency in tourist industry performance; and at the second stage, a truncated bootstrap regression model is used to pinpoint which explanatory factors impact on said efficiency levels by taking into consideration external variables mainly related to natural and cultural endowment, which are particular to the regions, as well as other facilities related with their accessibility conditions. We conduct our analysis for the full flow of tourism, as well as separately for both domestic tourism and international tourism, just in case any significant differences were to emerge in performance and outcomes.

The present study helps to enrich the extant literature on efficiency evaluation of tourist destinations in that it provides further insights into our understanding of tourist industry performance in Chile's regions, adding fresh empirical evidence to the thus far scant number of studies addressing Latin America in this field. The work is structured as follows. Section 2 presents the theoretical reference framework concerning efficiency evaluation in the tourist industry. Section 3 deals with the method used and the characteristics of the case study. Section 4 describes the empirical application and main findings. Finally, Section 5 sets out the most relevant conclusions to emerge from the work.

2 | THEORETICAL FRAMEWORK

This research is framed within the area of efficiency analysis of the cultural and tourist sector, particularly on performance evaluation in tourist destinations. We also focus on the study of cultural and historical heritage variables as determinants of said efficiency. In this vein, there are an abundant and ever-increasing number of efficiency literature studies in the specific field of tourism and hospitality. In addition to positing the main topics for study and future challenges, Sainaghi, Phillips, and Zavarrone (2017) offer a content analytical meta-approach on performance measurement in tourism, reflecting the scientific scope this line of research has achieved. In order to include a comparative reference work in the present paper, we should first point out the large number of studies addressing the hospitality sector. That is the case of performance evaluation of travel agencies (Barros & Matias, 2006; Fuentes, 2011) or restaurants (Reynolds & Thompson, 2007). However, most studies into the tourist industry basically deal with efficiency analysis of hotels and hotel chains from a range of different perspectives. Barros (2004 and 2006) and Arbelo, Pérez-Gómez, and Arbelo-Pérez (2016) estimate stochastic production frontiers for several Portuguese and Spanish hotel samples, respectively. Yet, most works on efficiency studies adopt an approach using non-parametric, and basically DEA techniques, in different versions. Such is the case of the studies by Sigala (2004) on three-star hotels in the UK; Perrigot, Cliquet, and Piot-Lepetit (2009) on hotel chains in France; Assaf and Cvelbar (2010) for the Slovenian hotel industry; and Brida et al. (2015) that focus on the hospitality sector in a North Italy region. Following the same approach, Mendieta-Peñalver, Perles-Ribes, Ramón-Rodríguez, and Such-Devesa (2016) try to measure efficiency and firm competitiveness of the main international hotel chains. Finally, Wang, Hung, and Shang (2006) and Shang et al. (2010) progress through two-stage conditioned efficiency models, complementing the DEA approach by means of a Tobit regression to analyse the efficiency of international tourist hotels in Taiwan. Assaf and Agbola (2011) use the same approach to evaluate the performance of Australian hotels.

[1]According to the Chilean subsecretariat for tourism (Gobierno de Chile, 2014), Chile as an actor on the world stage contributes 0.3% of international arrivals and 0.2% of international expenditure on tourism, according to UNWTO figures. Over the last few years, it has become an important sector of production, having contributed close to US$2,500 million in 2014.

However, what ties in more closely with our method is the area that explores the efficiency of tourist destinations, an area which has gained major importance over the last few years. This type of study is based on the notion of territorial competitiveness in the domain of tourism (Crouch & Ritchie, 1999), or how tourist destinations manage to use available inputs efficiently so as to attract the greatest possible share of tourist demand and so remain competitive against their main rivals. The majority of these studies involve a two-stage approach to gauging efficiency, principally adopting the method put forward by Simar and Wilson (2007).

First, they take into account a very straightforward regional production function by basically linking the number of nights slept as a function of accommodation capacity and tourist arrivals. Non-parametric techniques such as DEA are usually used in this initial analysis. A regression is then made between efficiency scores and other environmental variables, such as cultural and natural resources, safety, accessibility, and the like. The works of Barros et al. (2011) and Botti et al. (2009) for the efficiency evaluation of French destinations are examples of studies that adopt this approach. Others include Benito et al. (2014) with a similar approach for the case of Spanish regions; and Cracolici et al. (2008) and Suzuky, Nijkamp, and Rietveld (2011), who evaluate Italian tourist destinations using a more sophisticated production function, including some of the variables previously considered as external. In this line of research, mention should also be made of studies, which focus specifically on exploring the impact of cultural variables on the efficiency of the tourist sector, such as Cuccia et al. (2016) who seek to ascertain whether or not UNESCO nominations affect the efficiency of Italian tourist destinations, or the research by Herrero-Prieto and Gómez-Vega (2017), which focuses on evaluating the efficiency of Spanish regions in their bid to attract specifically cultural tourism.

As regards studies in the Latin American context, efficiency analyses remain scarce, despite the area representing an ever-more popular tourist destination. In this vein, we might first point to the works of Hadad, Hadad, Malul, and Rosenboim (2012) and Assaf and Josiassen (2012) where, amongst the sample of countries analysed, a wide range of Latin American countries are considered. A more specific case study is given in the work of Pérez, Guerrero, Pérez, and Caballero (2014) who conduct research into the efficiency of natural tourist destinations in Cuba. If we look for examples in Chile, we find Del Río (2015) whose work focuses on describing tourist demand in the region of Maule (Chile), whilst Román and Font (2014) undertake a study of tourist policy and sustainability in the same country. No reference examples have been found, which apply two-stage efficiency evaluation models for tourist destinations in Latin America; as a result of which, the present work seeks to contribute, to a certain extent, to filling the gap by analysing tourist industry performance in Chilean regions.

3 | APPLICATION: METHODOLOGY AND CASE STUDY

3.1 | Methodology

Broadly speaking, studies measuring the competitiveness of tourist destinations using non-parametric methods and two-stage efficiency analysis employ a managerial production function, albeit one which is applied to regional entities (Cracolici et al., 2008). It is therefore understood that regions handle, in a virtual manner, a series of resources such as accommodation capacity and visitor flows, with which to achieve certain results, measured in the number of overnights stays, in other words, intensity of tourist flows (Barros et al., 2011; Cuccia et al., 2016). It is therefore a problem of managerial optimisation, which yields varying levels of efficiency in performance, on which the impact of certain external variables is then analysed. In our work, we apply the same approach, introducing a variation since we delimit three models that allow us to observe the behaviour of the regions compared to different tourist flows depending on their origin, whether national, foreign, or the sum of both. The reason is to observe whether there are differentiated trends between tourist flows and to consider that, whilst certain regions may be efficient at attracting foreign tourists, they might not be so successful when it comes to attracting domestic tourism and vice versa. Likewise, at the second stage, we can observe whether the same variables equally shape efficiency for each type of tourism.

The methodological approach we adopt follows a two-stage conditioned efficiency evaluation model. We first evaluate the level of efficiency of regions as tourist destinations applying non-parametric techniques—DEA—on the basis of the regional production function explained before. DEA is a mathematical programming technique designed to evaluate the relative efficiency of a group of comparable decision-making units (DMUs), in our case, regions as tourist destinations. The advantages of this method hinge on the fact that it does not require specifications in the behaviour model of the decision units or explicit functional forms of the production function, as the approach basically consists of a simple definition of a production frontier comprising the best units, prior to quantifying how efficient the rest of the sample is in relation to distance from the frontier. This distance (efficiency score) between observed DMU and the most efficient DMU gives a measure of the radial reduction in inputs that could be achieved for a given measure of output. By contrast, DEA is a deterministic model because it assumes that any distance from the optimal frontier is the result of inefficient performance and is not random. This may be overcome through conditioned efficiency analysis, the methodological approach chosen in the present research, because we aim to estimate how and how much environmental variables might affect the basic efficiency measure previously obtained.

We shall not dwell on giving a technical explanation of DEA, because it is a fairly standardized mathematical procedure.[2] It should just be pointed out that in the optimisation process, we adopt an output-based focus; in other words, we determine which combinations of factors maximize tourist output, also following a technological hypothesis of constant returns to scale (CRS), because this allows us to obtain a measure of the overall technical efficiency (Ganley & Cubbin, 1992) and is the most common hypothesis in studies of this kind (Cuccia et al., 2016). As regards the second stage of our methodological approach, we attempt to estimate the degree of correlation of the

[2]For technical details on the DEA method as evaluation technique, its advantages and detractors, see Ganley & Cubbin (1992) and Fernández-Blanco, Herrero, and Prieto-Rodríguez (2013).

previously obtained efficiency ratios with regard to other environmental variables, which could affect regional performance in attracting tourist flows. On the basis of our main research purpose, these include some endowment variables such as the natural resources and cultural heritage found in each region, as well as accessible infrastructure. Likewise, also included are indicators that express the level of public and private cultural activity and the size of the creative sector together with certain variables related to safety. Most of these variables are calculated in relation to regional area and other are measured per inhabitants in the regions. We perform the second-stage analysis running a regression with the efficiency scores as the dependent variable, and the environmental variables as the independent ones. Nevertheless, it should be recognized that efficiency scores might be correlated with each other and with the exploratory variables used in the second term. For this reason, we use truncated models to correct bias in the estimated parameter, because this proves more appropriate than censored-Tobit or OLS regressions (Simar & Wilson, 2007).

3.2 | Case study

For all the regions in Chile, and considering the period between 2009 and 2014, we constructed a database comprising 15 decision units, which is the number of regions in Chile,[3] and six time periods, such that our set of data is a panel of balanced data with 90 observations. Table 1 presents the seven variables used in the first stage, and the 17 used in the second stage, together with a brief description thereof, and their main descriptive statistics.[4] With regard to efficiency evaluation, as already pointed out, the analysis is not confined to domestic tourist flows (tourist movements of Chilean nationals) but also covers foreign tourists, whatever their reason for being in Chile. This is why, whereas the accommodation capacity variable (BEDS_T) is defined permanently for each region as the total sum of available beds in hotels and other tourist establishments, the variables relating to total arrivals in terms of tourists (ARRIV_) and total overnight stays (NIGHTS_) are broken down into national tourists (those living in Chile) and foreign tourists for each region and for whatever type of accommodation chosen. As a result, for the first stage of analysing the efficiency of regions in Chile, the homogeneity hypothesis of the production function is supported (Dyson et al., 2001), because this is defined in a consistent and uniform manner for all the regions and consists of optimizing the number of overnight stays based on resources such as accommodation capacity and tourist flow, whether national, international, or both at the same time.

As regards the second stage variables, which might impact on the tourist industry results, following the main aim of this research, we first considered indicators relating to the size and dynamism of the regional culture sector, first using an indicator that reflects cultural heritage endowment (CH), the sum of all the declared national museums and monuments in each region, and second, as a reflection of public sector support in this field, we included the public funding dedicated to cultural development and the arts (ARTFUNDS). Together with this, two variables were introduced, which reflect the importance of private cultural initiatives when making regions more efficient, in this case, FIRMS, which includes the total number of enterprises dedicated to cultural activities; and LABOUR, which reflects the number of those working in this industry. Added to this group of cultural variables are other indicators reflecting the provision of cultural facilities of a more mercantile nature, such as the number of movie theatres (FILM) and their total capacity (FILMCAP) as well as travel agency services and tour operators (TRAVELAG).

As regards natural resources as one of the possible main drivers of Chile's tourist appeal, we generated four variables depending on the type of natural resource, all of which were measured both in terms of regional surface area: national parks (NAT_P), natural reserves (NAT_R), natural monuments (NAT_M), and protected wild areas (NAT_W). We have also considered number of visitors (both domestic and foreign) to protected wild areas (VISW_), all measured per regional inhabitant in the regions. Added to these environmental resources are other endowments related to the level of regional accessibility and communication: kilometres of roads (ROADS) and internet connections (INTERNET). Finally, another variable related to the level of safety and security was also considered, measured in the form of the number of crimes reported at a regional scale (SAFETY).

As a prior step to analysing regional efficiency in tourist industry performance, it is interesting to introduce a brief preliminary description of certain data, so as to gain an initial impression of how tourism currently stands in Chile and its link to cultural tourism. Bearing in mind that we are considering both national and international tourism, it is important to point out that as a whole, it has undergone substantial growth over the period studied (Graph 1), particularly after 2010, although tourist flows have stabilized in the last 2 years. The most commonly used means of transport for making trips is by road and accounts for around 60% in the case of international tourists, and an even higher number in the case of domestic tourists. The bulk of the international tourists who reach Chile come from South-American countries, mainly Argentina, Brazil, Bolivia, and Peru, and the stated motives for travelling in 2014 were 52% for holidays, followed by family affairs 24%, and 18% for business (Gobierno de Chile, 2014).

The question to be asked now is which regions enjoy the greatest tourism flows. With regard to the distribution of both national and international tourists, in the period studied, Graph 2 depicts the arrivals of travellers to tourist accommodation establishments distributed in terms of the various regions in Chile. As can be seen, most travellers are to be found in the Metropolitan Region which, in 2014, accounted for over 40% of the 6.6 million tourists who came, followed by the Region of Valparaíso with 16.3% and the Region of Antofagasta

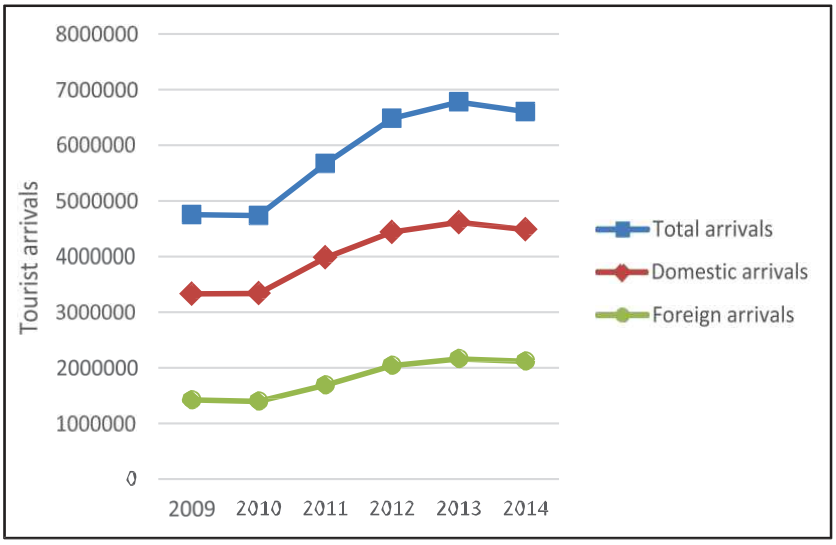
[3]We follow the most recent regional classification after the 2007 constitutional reform, dividing the country into 15 regions, which from north to south are as follows: Arica and Parinacota (XV), Tarapacá (I), Antofagasta (II), Acacama (III), Coquimbo (IV), Valparaíso (V), Metropolitan Region (XIII), O'Higgins (VI), Maule (VII), Biobío (VIII), La Araucanía (IX), Los Ríos (XIV), Los Lagos (X), Aysén (XI), and Magallanes (XIII).

[4]All data were obtained from official Chilean statistical publications: data regarding the tourist industry and flows, from the National Tourism Service (SERNATUR); data related with cultural activities and endowments, from the National Council for Culture and Arts (CNCA). The remaining data are taken from the National Institute of Statistics (INE). Worth highlighting is the work by Aroca, Brida, and Volo (2017) who bring to light a number of inconsistencies in the gathering of statistical data concerning the tourist sector in Chile, particularly with regard to the accommodation variable, between SERNATUR and INE, evidencing that the latter is underestimated and should reflect a growing trend, more in line with the information provided by SERNATUR, the source used in the present research.

TABLE 1 Variables and descriptive statistics

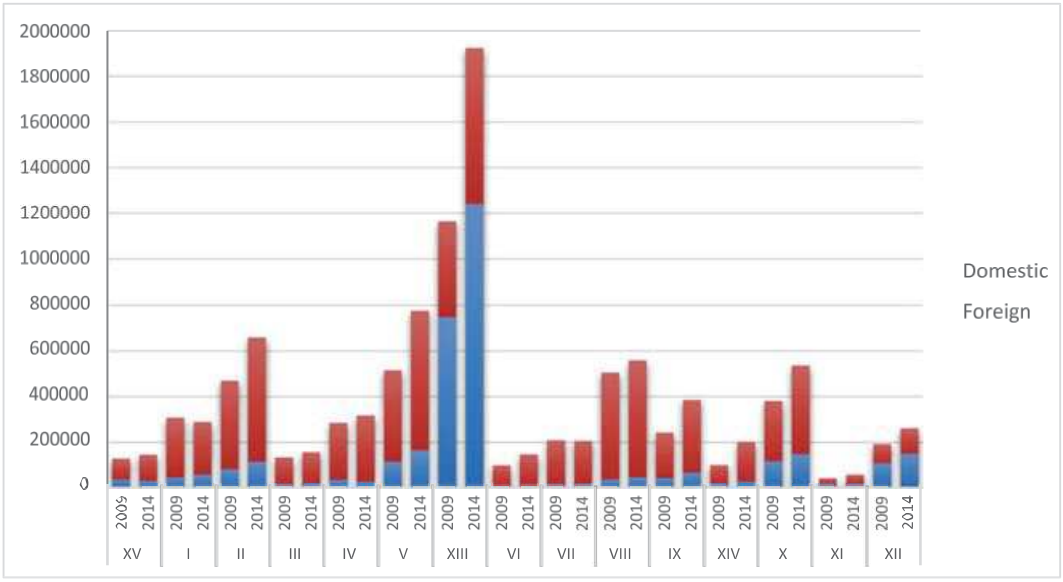
Variable	Description	Mean	Total	Standard deviation	Variance	Minimum	Maximum	Range
First stage: Production function (in thousands)								
BEDS_T_INHAB	Total accommodation capacity per inhabitant in each region	8.582	772.363	5.013	25.130	2.024	20.966	18.942
ARRIV_T_INHAB	Total tourist arrivals per inhabitant in each region	533.125	47,981.200	359.263	129,070.000	91.782	1,702.810	1,611.030
NIGHTS_T_INHAB	Total tourist overnight stays per inhabitant in each region	1,039.200	93,528.000	668.321	446,653.000	201.382	3,156.960	2,955.580
ARRIV_DOM_INHAB	Arrivals of domestic tourists per inhabitant in each region	399.613	35,965.200	231.670	53,671.000	61.073	961.164	900.091
NIGHTS_DOM_INHAB	Overnight stays of domestic tourists per inhabitant in each region	773.193	69,587.300	426.820	182,176.000	118.186	1,880.840	1,762.660
ARRIV_FOR_INHAB	Arrivals of foreign tourists per inhabitant in each region	137.603	12,384.300	196.538	38,627.000	7.945	977.737	969.792
NIGHTS_FOR_INHAB	Overnight stays of foreign tourists per inhabitant in each region	26.601	2,394.070	34.007	1,156.490	1.601	170.092	168.491
Second stage: External variables								
CH_PC	Regional state heritage (museums and listed national monuments)	0.123	11.113	0.080	0.006	0.024	0.385	0.361
NAT_P_KM2	Surface area of national parks per km^2 of area in each region	0.070	6.274	0.104	0.011	0.000	0.404	0.404
NAT_R_KM2	Surface area of national reserves per km^2 of area in each region	0.046	4.136	0.065	0.004	0.000	0.204	0.204
NAT_M_KM2	Surface area of natural monuments per km^2 of area in each region	0.001	0.094	0.003	0.000	0.000	0.013	0.013
NAT-_W_KM2	Total surface area of protected wild areas per km^2 of area in each region	0.117	10.505	0.160	0.026	0.004	0.582	0.578
SAFETY_INHAB	Number of crimes reported per inhabitant in each region	0.185	16.616	0.053	0.003	0.104	0.382	0.278
ARTFUNDS_INHAB	Resources allocated from the National Fund for Cultural Development and the Arts (FONDART) in thousands of Chilean pesos per inhabitant in each region	0.389	35.044	0.395	0.156	0.032	2.104	2.072
VISWT_INHAB	Total number of visitors to protected wild areas per inhabitant in each region	0.293	26.393	0.497	0.247	0.001	2.339	2.338
VISWD_INHAB	Domestic visitors to protected wild areas per inhabitant in each region	0.183	16.509	0.258	0.066	0.001	1.218	1.217
VISWF_INHAB	Foreign visitors to protected wild areas per inhabitant in each region	0.110	9.886	0.252	0.063	0.000	1.121	1.121
ROADS_INHAB	Kilometres of road per inhabitant in each region	0.002	0.189	0.001	0.000	0.000	0.004	0.004
INTERNET_INHAB	Internet connections per inhabitant in each region	0.104	9.318	0.034	0.001	0.045	0.185	0.140
FILM_INHAB	Number of movie theatres per inhabitant in each region	0.000	0.001	0.000	0.000	0.000	0.000	0.000
FILMCAP_INHAB	Capacity of movie theatres per inhabitant in each region	0.003	0.313	0.002	0.000	0.000	0.007	0.006
FIRMS_INHAB	Number of enterprises devoted to cultural activities per inhabitant in each region	0.000	0.043	0.000	0.000	0.000	0.001	0.001
LABOUR_INHAB	Number of workers employed in the cultural sector per inhabitant in each region	0.002	0.185	0.003	0.000	0.000	0.014	0.013
TRAVELAG_INHAB	Number of travel agencies and tour operators per 1.000 inhabitants in each region	0.138	12.385	0.147	0.022	0.011	0.782	0.771

Source: Authors' own based on the National Tourism Service (SERNATUR) for tourist industry data and tourist flows; National Council for Culture and Arts (CNCA) for cultural variables; and National Institute of Statistics (INE) for the remaining information.



Source: Authors' own based on the National Tourism Service (SERNATUR)

GRAPH 1 Evolution of tourism in Chile between 2009 and 1014 [Colour figure can be viewed at wileyonlinelibrary.com]



Note: Regional acronyms according to the geographical order from North to South

Source: Authors' own based on the National Tourism Service (SERNATUR)

GRAPH 2 Distribution of the arrival of passengers to tourist accommodation establishments by region for 2009 and 2014 [Colour figure can be viewed at wileyonlinelibrary.com]

with 13.8%. Between 2009 and 2014, the percentage of travellers increased by 38.9%, although this is not reflected evenly throughout all the regions. The greatest impact was in the Metropolitan Region, followed by the Region of Antofagasta, Valparaíso, Los Lagos, and Los Ríos. The other regions showed no appreciable increase in the 6 years.

Indeed, as expected, given the country's geographical and administrative configuration, the central regions, the Metropolitan Region, and Valparaíso, together with the Region of Antofagasta to the north, achieve the best results. The city of Santiago in the Metropolitan Region is the country's capital and Chile's main urban nucleus. The capital of the Region of Valparaíso is the city of Valparaíso itself, a university and cultural city par excellence, declared a World Heritage site by the United Nations Organisation for Education, Science, and Culture (UNESCO) on 2 July 2003. The capital of the Region of Antofagasta is the city of Antofagasta itself, which contains historical and natural monuments, attractive landscapes, and beaches with warm waters and gentle waves. Its growth is due to the port's activities, industry, and mining in the area. Yet, in which regions does tourism evidence the greatest weight in relation to the total number of arrivals of domestic tourists and the total number of arrivals of foreign tourists? Again prominent in the case of domestic tourism are the same regions as in the overall total, namely, the Metropolitan Region and the regions of Valparaíso and Antofagasta, together with the regions of Los Lagos and Biobío, which have well-developed tourist infrastructure that helps attract domestic tourism. As for international tourism, the Metropolitan and Valparaíso regions again top the list, joined on this occasion by the

region of Magallanes to the extreme south of the country. It is also the country's largest region and offers one of the most appealing natural attractions for overseas tourists in the shape of the Torres del Paine National Park, as well as lakes, glaciers, and ice sheets.

Given the particular nature of the geographical configuration of Chile as a country and the marked concentration of the population and tourist activities in the central regions, principally in the Metropolitan region, it proves especially difficult to guarantee the criterion of homogeneity in the study units (regions) for efficiency evaluation using DEA (Dyson et al., 2001). This is why, when carrying out this mathematical procedure to our case study, all the variables of the production function have been taken into account in terms of the number of inhabitants in each region. By doing this, we make sure that the range of inputs and outputs is more uniform for all the units, even though the sense of the distribution of resources and tourist flow between regions in Chile is maintained. Nevertheless, it is also true that the units must be relatively consistent to allow for comparison, whilst also being sufficiently heterogeneous to allow for some comparative information to be extracted (Golany & Roll, 1989). This permits a certain margin of variation for the requirement of homogeneity, which is supported by the results of Pearson's variation coefficient, since in all the variables (except those associated with international tourism, for reasons of specificity), it is between 0.5 and 0.7, such that the degree of dispersion compared to the variables around its mean proves reasonable.

4 | RESULTS

4.1 | First stage: efficiency evaluation

The DEA method is applied to obtain the efficiency ratios for each of the three previously mentioned models, total tourism, domestic tourism, and foreign tourism recorded in Chile's regions. We thus start with the production functions devised for each of the models (A, B, and C models, respectively), and a panel of data is generated so as to improve the statistical consistency of the econometric model. As a result, each of the regions will be considered as an independent unit in each of the years contained in the sample, obtaining a total of 90 observations. We are thus able to compare the tourist industry results for each region's ability to attract tourism, taking account of its resources, with the other regions, as well as their practices over time.

As regards the type of model, we opted for an output oriented model, given that the interpretation of the results thus proves clearer and more suited to the characteristics of the sector in question, in addition to also being the most widely used approach in the reference works (Barros et al., 2011; Cracolici et al., 2008 and Cuccia et al., 2016). As for the technological hypothesis, again following the above-mentioned studies, we opted for the model, which considers CRS and provides information concerning the overall efficiency (technical efficiency and scale efficiency), as opposed to the variable returns to scale option, which is confined to estimating technical efficiency.

The results of the empirical application are now explained. As regards model A, which deals with total tourism (Table 2), it can be seen how the mean efficiency over the whole period is 77.06% which, broadly speaking, means that Chilean regions could improve the number of overnight stays by 22.94% in order to reach the optimal figure. No region was found to be efficient in average over the whole period, although the Metropolitan Region evidenced the best ratio with a mean of 98.47%, and which is located on the optimal frontier in 2011 and 2012. It is therefore the region that hosted the largest number of tourists and the most efficient in terms of overnight stays taking account of its resources. This is obviously influenced by its being the country's capital and the arrival point and reference point for overseas

TABLE 2 Regional efficiency scores. CRS pool model. Model A

Model A. Total tourists							
Region	CRS 09	CRS 10	CRS 11	CRS 12	CRS 13	CRS 14	Mean CRS
Arica and Parinacota	82.99	83.95	79.33	74.76	70.63	73.75	77.57
Tarapacá	85.58	78.31	77.79	75.27	72.13	70.47	76.59
Antofagasta	75.36	74.51	77.54	76.26	76.89	79.47	76.67
Atacama	81.71	67.30	70.30	80.04	84.35	69.62	75.55
Coquimbo	97.91	100.00	86.71	90.01	86.72	88.88	91.71
Valparaíso	71.82	71.72	70.78	69.43	66.68	67.22	69.61
Metropolitan Region	94.89	97.71	100.00	100.00	99.60	98.62	98.47
O'Higgins	73.11	78.66	76.24	80.00	78.94	83.28	78.37
Maule	80.13	72.32	71.00	68.12	67.39	69.00	71.33
Biobío	77.32	81.31	87.29	77.27	76.09	75.76	79.17
La Araucanía	80.72	89.39	86.26	83.84	82.92	84.23	84.56
Los Ríos	62.57	69.46	68.36	69.19	71.47	72.86	68.99
Los Lagos	64.59	64.58	69.40	70.81	71.07	71.50	68.66
Aysén	60.25	60.12	61.74	66.86	62.43	65.12	62.75
Magallanes	70.97	74.85	77.46	74.91	78.79	78.83	75.97
Mean efficiency	77.33	77.61	77.35	77.12	76.41	76.57	77.06
No. of efficient regions	0.00	1.00	1.00	1.00	0.00	0.00	0.00

Source: Authors' own.

tourism. Together with said region are the regions of Coquimbo and Araucanía, key centres of sun, and sand holiday tourism or for enjoying the lakes in the country's hinterland, respectively. At the other end of the scale, we find the Region of Aysén, the Region of Los Lagos, and the Region of Los Ríos, all of which are below 70%.

It is interesting to see how the mean efficiency is slightly higher at the start of the sample and tends to fall off in the latter years. Nevertheless, Malmquist Indices have been calculated in order to chart the evolution of efficiency over the time interval considered. We are in a position to affirm that the situation is close to one of remaining unchanged. There is hardly any technical progress. Indeed, the total productivity of the factors even falls slightly, by 1% between 2009 and 2011, and only a few noticeable improvements in the efficiency of certain regions are worth mentioning, with the figure averaging 5%. We therefore opted not to conduct an in-depth analysis of the evolution of efficiency, because it was felt that, at least for the time interval analysed, the situation is almost invariable.

Continuing with the analysis of regional efficiency, in the case of model B, which deals solely with analysing the movements of nationals (Table 3), we find that the mean accumulated efficiency is slightly lower, reaching 76.33%. In other words, when it comes to attracting domestic tourists, regions in Chile evidence a 23.77% margin for improvement. Coquimbo, the main area for sun and sand tourism as pointed out, emerges as the most efficient region with 93.89% and is located on the efficient frontier in the first 2 years. We then have the regions of Araucanía and Bio Bio, which boast outstanding natural heritage and inland lakes, although it can be said that most of the regions are located at an efficiency interval close to the mean. In contrast, the Metropolitan and Valparaíso regions are less efficient at persuading domestic tourists to stay overnight. Both cases, particularly the latter, are blessed with exceptional cultural heritage and contain two of the five UNESCO World Heritage properties to be found in the country. This provides a preview of the differing behaviour of domestic and foreign tourists vis-à-vis their preferences for various tourist destinations, as shall now be seen.

Model C, which deals only with foreign tourists (Table 4) yields the following results. First, the mean accumulated efficiency is the lowest in the estimations, 74.04%. This means that regions in Chile are more efficient at drawing domestic tourists than overseas tourists, because the latter are not distributed evenly around the various regions but tend to be concentrated in those regions, which offer the main international attractions. Thus, and quite logically bearing in mind that it is the main arrival point for overseas tourists because over a third of international tourists who reach Chile do so via its main airport, the Metropolitan Region is the most efficient and is located at the optimal frontier in the last 2 years of the analysis. How the Region of Atacama, one of the main international attractions with its desert and mining landscapes, has evolved proves striking because, after starting out with high efficiency levels, it falls quite noticeably, probably due to the increased offer of hotels. The regions to the north, particularly Coquimbo, Antofagasta, and Tarapacá also evidence high levels of efficiency. It is important to stress that the regions to the north are one of the main vehicle entrance points into the country from the neighbouring countries of Bolivia, Peru, and Argentina, which are, as pointed out earlier, together with Brazil, the main sources of tourists coming into Chile. For its part, Antofagasta represents an important centre of attraction for business tourism, where the presence of international tourists plays a key role.

Analysing the potential optimal improvements in the use of each of the inputs and vis-à-vis achieving output allows us to pinpoint the origin of the inefficiencies inherent in each region and thus offers a more useful and practical contribution for intermediaries as well as

TABLE 3 Regional efficiency scores. CRS pool model. Model B

Model B. Domestic tourists							
Region	CRS 09	CRS 10	CRS 11	CRS 12	CRS 13	CRS 14	Mean CRS
Arica and Parinacota	87.28	87.60	83.14	76.20	71.17	67.29	78.78
Tarapacá	85.66	76.16	77.48	74.03	69.01	64.11	74.41
Antofagasta	75.19	74.85	78.76	79.64	78.07	77.92	77.41
Atacama	79.69	67.00	78.01	84.07	87.73	71.48	78.00
Coquimbo	100.00	100.00	88.53	92.35	89.82	92.63	93.89
Valparaíso	68.37	70.22	69.75	67.75	65.10	63.64	67.47
Metropolitan Region	70.55	71.68	68.54	67.65	69.04	67.88	69.22
O'Higgins	74.86	80.69	77.50	81.03	79.87	78.98	78.82
Maule	82.33	73.46	71.90	68.09	68.35	71.25	72.56
Biobío	87.94	91.49	100.00	87.47	84.98	85.85	89.62
La Araucanía	82.54	92.63	87.60	85.48	83.73	87.62	86.60
Los Ríos	61.79	73.07	70.59	70.58	71.89	77.86	70.96
Los Lagos	65.23	64.47	66.74	69.69	70.93	72.44	68.25
Aysén	60.81	61.60	64.21	71.76	65.64	64.52	64.76
Magallanes	74.78	78.86	76.96	72.03	73.22	69.01	74.14
Mean efficiency	77.13	77.59	77.31	76.52	75.24	74.17	76.33
No. of efficient regions	1.00	1.00	1.00	0.00	0.00	0.00	0.00

Source: Authors' own.

TABLE 4 Regional efficiency scores. CRS pool model. Model C

Model C. Foreign tourists							
Region	CRS 09	CRS 10	CRS 11	CRS 12	CRS 13	CRS 14	Mean CRS
Arica and Parinacota	78.22	78.05	73.31	75.40	65.61	62.52	72.19
Tarapacá	88.23	87.43	76.02	74.19	75.99	70.67	78.76
Antofagasta	81.55	82.64	86.35	83.35	89.27	87.87	85.17
Atacama	100.00	72.94	56.10	67.84	67.96	53.70	69.76
Coquimbo	94.44	100.00	80.32	89.41	80.63	77.76	87.09
Valparaíso	86.97	79.09	77.38	79.64	76.87	76.01	79.33
Metropolitan Region	99.67	99.93	100.00	100.00	98.68	97.62	99.32
O'Higgins	57.97	61.82	66.15	72.89	75.43	74.63	68.15
Maule	56.85	63.92	66.32	74.02	65.13	66.30	65.42
Biobío	63.41	73.37	73.00	68.69	72.52	68.00	69.83
La Araucanía	74.74	76.97	76.43	73.33	74.62	80.84	76.16
Los Ríos	63.03	65.72	65.72	71.09	68.21	72.83	67.77
Los Lagos	65.71	66.16	63.65	61.60	61.97	61.37	63.41
Aysén	63.34	58.91	56.86	52.57	55.13	54.56	56.90
Magallanes	71.09	75.81	72.24	70.12	71.82	67.86	71.49
Mean efficiency	76.35	76.18	72.66	74.28	73.32	71.50	74.05
No. of efficient regions	1.00	1.00	1.00	1.00	0.00	0.00	0.00

Source: Authors' own.

those in charge of cultural tourism. It is important to stress that the data shown in Table 5 reflect the mean of the optimal changes for each region in each of the years. On the input side, it can be concluded that the main focus of inefficiency is the excessive number of hotels available in certain regions (such as O'Higgins, Aysén, Arica, Valparaiso, and Atacama) whereas all the regions must make a greater effort to increase the number of visitor overnight stays given the available resources. Likewise, there appears to be slight saturation, as regards the optimum, of domestic tourism in the region of Biobío and in international tourism in the Metropolitan region.

4.2 | Second stage: impact of external variables on tourist efficiency

In the second stage of our efficiency analysis, we explore the impact of contextual variables on the technical efficiency of the regional

TABLE 5 Possibilities for improving in the management of inputs and outputs by regions. Mean data

	Model A. Total tourists			Model B. Domestic tourists			Model A. Foreign tourists		
Regions	T_Beds Gain %	T_Arrivals Gain %	T_Nights Gain %	T_Beds Gain %	Arriv_Dom Gain %	Nights_Dom Gain %	T_Beds Gain %	Arriv_For Gain %	Night_For Gain %
Arica and Parinacota	−9.12	0.00	29.44	−19.30	0.00	28.23	0.00	0.00	39.56
Tarapacá	0.00	0.00	31.08	−0.28	0.00	35.52	0.00	0.00	27.86
Antofagasta	0.00	0.00	30.48	0.00	0.00	29.26	0.00	0.00	17.54
Atacama	−4.29	0.00	33.39	−3.37	0.00	29.29	0.00	0.00	49.36
Coquimbo	0.00	0.00	9.40	0.00	0.00	6.76	0.00	0.00	15.81
Valparaíso	−10.66	0.00	43.79	−20.37	0.00	48.39	0.00	0.00	26.31
Metropolitan Region	0.00	0.00	1.59	−27.08	0.00	44.52	0.00	−0.12	0.70
O'Higgins	−19.91	0.00	27.80	−15.08	0.00	26.96	−20.98	0.00	48.21
Maule	−8.98	0.00	40.67	−4.18	0.00	38.37	−27.09	0.00	53.77
Biobío	0.00	0.00	26.62	0.00	−1.17	11.92	0.00	0.00	43.59
La Araucanía	−0.62	0.00	18.38	−2.54	0.00	15.64	0.00	0.00	31.44
Los Ríos	0.00	0.00	45.29	0.00	0.00	41.60	0.00	0.00	47.93
Los Lagos	0.00	0.00	45.92	−5.51	0.00	46.80	0.00	0.00	57.85
Aysén	−22.24	0.00	59.60	−33.85	0.00	54.87	0.00	0.00	76.40
Magallanes	0.00	0.00	31.81	−34.66	0.00	35.13	0.00	0.00	40.03

Source: Authors' own.

destinations. To achieve this, a regression is implemented with the efficiency ratios as the dependent variable and the external variables as independent variables. Nevertheless, DEA literature recognizes that the efficiency ratios obtained during the first stage might be correlated with the explanatory variables used in the second term, which often leads to inconsistent and biased estimations (Simar & Wilson, 2000). Using a bootstrap procedure may help overcome this problem because it offers certain improvements in the efficiency of the estimation and inference at the second stage.

As regards the independent variables, a set of explanatory variables is identified, which might well affect the regions' efficiency as tourist destinations. As pointed out in the methodology section, what must first be taken into account are the indicators of cultural heritage labelling, weighted by the size of the region, which could represent the possible influence of reputation on the motivation underlying cultural tourism. Second, we consider variables related to regional accessibility such as kilometres of motorway, which would provide tourists with easier and faster access. Third, we consider indicators that seek to reflect the omnivorous component of tourism, through visits to natural heritage locations. Finally, we consider variables related to the region's level of cultural activities, measured by regional expenditure on arts, the weight of the private cultural sector through the number of cultural enterprises, the number of movie theatres and their capacity, connections to Internet, the number of travel agencies and tour operators, workers employed in creative enterprises, as well as other variables such as those linked to safety and security through the number of reported crimes. We measure all these variables in terms of km^2 or inhabitants in each region. We also considered an annual time trend so as to take account of the possible effects of time on the region's efficiency.

Having estimated the efficiency ratios in the previous section, these are regressed on the contextual variables. We regressed the efficiency ratios assuming CRS on the previous set of explanatory variables. We estimated three models: conventional Tobit, robust Tobit, and Bootstrap with all the explanatory variables. Table 6 presents the results of the models estimated for the three categories of tourists: Total, Domestic, and Foreign. An initial overview of the results shows that for the case of overall tourist flow, the significant variables are the same in the three econometric models. Moreover, the signs of the coefficients do not basically change, and the values are almost the same. A similar situation can be seen in the category of foreign tourists, where the three models display virtually the same results. The same cannot be said, however, for the category of domestic tourists, because different behaviour is evident in each of the three models estimated, with the bootstrap model displaying the most selective results.

As regards interpreting the results, the following can be pointed out. The comparative analysis shows that, in the category of total number of tourists, there is a set of variables that prove non-significant in all the specifications. These are regional surface area of national reserves belonging to the state, the main road network, and foreign visitors to protected wild areas, together with the availability of movie theatres and the capacity thereof as well as the number of creative enterprises in the region, and the resources allocated from the National Fund for Cultural Development and the Arts. As a result, all of them were felt to have an impact on regions' efficiency with regard to their ability to attract tourism.

In contrast, there is a group of variables linked to cultural and natural heritage, such as availability of museums and existing national historical monuments together with the importance of natural monuments and protected wild areas, which have a positive impact. This might be indicative of the omnivorous nature of the overall tourist flows in Chile, and which take into account both cultural as well as natural attractions when planning the trip. Certain other variables also prove significant linked to the contribution made by the private cultural sector, such as the number of travel agencies and tour operators, workers employed in creative enterprises, and that make available to tourists the means for them to visit the most relevant cultural attractions in each region.

One factor that does not make a positive contribution but which, in fact, does the quite the opposite is permanent connections to internet.[5] A greater number of connections does not necessarily reflect an efficient use of technology but indeed may in many instances indicate quite the contrary, and which is then reflected in the efficiency ratios. Finally, one obvious relation is the negative link between efficiency ratios and the number of crimes per inhabitant.

In addition, when taking the regions' efficiency in attracting domestic tourists as the dependent variable, we can see how the variables that prove significant in the three models estimated are; the surface area covered by national parks in the region, but in the opposite sense, indicating that having a greater amount of national heritage available does not enhance the efficiency of the regions for domestic tourists. Significant is the number of crimes, which by displaying a negative sign, allows us to infer that the greater the number of crimes reported, the lower the efficiency at a regional scale. Also significant (only for the Tobit models; $p < .1$) were the main road network variable and movie theatre capacity. In the former case, it evidences one trait of domestic tourists, who prefer using their own transport, such that a region's efficiency will improve if it has more kilometres of road, and for the capacity of the movie theatres, which indicates that the greater the capacity of the movie theatres the lower the levels of regional efficiency. This indicates that a greater availability discourages domestic tourists from making use of the varied general tourism and cultural tourism in particular.

For the category of foreign tourists, the variable associated to cultural heritage has a positive impact on regional efficiency ratios, complemented by the variable representing the number of people working in creative enterprises, reflecting that for this category of tourists, cultural attractions hold a great deal of importance when they are planning their trips. Once again, the variable corresponding to crimes emerges as significant, but with a negative impact. What also has a negative effect is the support awarded by the National Fund for Cultural Development and the Arts. One possible explanation for this is that the funding might not be being used efficiently to promote cultural wealth in the regions. Finally, the regional surface area covered by national parks belonging to the state also has a negative impact, reflecting the fact that despite their size, they do not prove to be a determining attraction in drawing external tourist flows.

[5]This corresponds to the number of clients with point to point connection and access to technologies via DLS, cable modem, and WILL, amongst others.

TABLE 6 Results of the estimation of the models applied in the second stage

	Model 1: Conventional Tobit			Model 2: Robust Tobit			Model 3: Bootstrap		
Category	Coef.	Std. Err.	p value	Coef.	Std. Err.	p value	Coef.	Std. Err.	p value
General									
CH_PC	0.76	0.30	.0150*	0.76	0.25	.0030**	0.76	0.34	.0280*
NAT_P_KM2	−1.39	0.26	.0000**	−1.39	0.22	.0000**	−1.39	0.29	.0000**
NAT_R_KM2	−0.18	0.30	.57	−0.18	0.33	.59	−0.18	0.52	.74
NAT_M_KM2	9.57	2.92	.0020**	9.57	2.67	.0010**	9.57	3.54	.0070**
SAFETY_INHAB	−0.50	0.21	.0190*	−0.50	0.23	.0310*	−0.50	0.27	.0660†
ARTFUNDS_INHAB	−0.03	0.04	.46	−0.03	0.04	.47	−0.03	0.05	.60
VISWD_INHAB	0.14	0.07	.0460*	0.14	0.06	.0120*	0.14	0.07	.0390*
VISWF_INHAB	0.03	0.10	.77	0.03	0.07	.70	0.03	0.10	.76
ROADS_INHAB	8.44	16.69	.62	8.44	18.10	.64	8.44	22.58	.71
INTERNET_INHAB	−1.32	0.40	.0010**	−1.32	0.36	.0000**	−1.32	0.44	.0030**
FILM_INHAB	0.02	0.02	.40	0.02	0.01	.23	0.02	0.02	.42
FILMCAP_INHAB	−13.13	8.29	.12	−13.13	7.99	.11	−13.13	10.37	.21
FIRMS_INHAB	−95.04	63.59	.14	−95.04	73.63	.20	−95.04	81.80	.25
LABOUR_INHAB	33.65	5.77	.0000**	33.65	5.33	.0000**	33.65	6.78	.0000**
TRAVELAG_INHAB	0.41	0.20	.0450*	0.41	0.22	.0650†	0.41	0.24	.0830†
_cons	0.89	0.04	.0000**	0.89	0.04	.0000**	0.89	0.05	.0000**
Sigma	0.06	0.00		0.06	0.01		0.06	0.00	
Domestic									
CH_PC	−0.07	0.38	.85	−0.07	0.36	.84	−0.07	0.43	.87
NAT_P_KM2	−1.40	0.32	.0000**	−1.40	0.27	.0000**	−1.40	0.34	.0000**
NAT_R_KM2	0.64	0.37	.0900†	0.64	0.46	.17	0.64	0.64	.32
NAT_M_KM2	5.16	3.60	.16	5.16	3.92	.19	5.16	5.58	.36
SAFETY_INHAB	−0.58	0.26	.0280*	−0.58	0.25	.0230*	−0.58	0.34	.0870†
ARTFUNDS_INHAB	−0.04	0.05	.37	−0.04	0.05	.43	−0.04	0.07	.59
VISWD_INHAB	0.06	0.09	.50	0.06	0.07	.40	0.06	0.11	.58
VISWF_INHAB	0.18	0.12	.15	0.18	0.10	.0880†	0.18	0.21	.41
ROADS_INHAB	37.26	20.63	.0750†	37.26	19.23	.0560†	37.26	26.60	.16
INTERNET_INHAB	−0.70	0.49	.16	−0.70	0.48	.15	−0.70	0.67	.30
FILM_INHAB	0.02	0.03	.55	0.02	0.02	.41	0.02	0.03	.65
FILMCAP_INHAB	−18.38	10.25	.0770†	−18.38	9.55	.0580†	−18.38	14.19	.20
FIRMS_INHAB	−15.61	78.68	.84	−15.61	82.87	.85	−15.61	117.13	.89
LABOUR_INHAB	1.58	7.14	.83	1.58	5.99	.79	1.58	8.24	.85
TRAVELAG_INHAB	0.30	0.25	.23	0.30	0.25	.23	0.30	0.31	.33
_cons	0.90	0.05	.0000**	0.90	0.05	.0000**	0.90	0.07	.0000**
Sigma	0.07	0.01		0.07	0.01		0.07	0.01	
Foreign									
CH_PC	0.85	0.38	.0280*	0.85	0.36	.0210*	0.85	0.35	.0150*
NAT_P_KM2	−1.13	0.32	.0010**	−1.13	0.30	.0000**	−1.13	0.32	.0000**
NAT_R_KM2	0.11	0.37	.78	0.11	0.32	.74	0.11	0.36	.77
NAT_M_KM2	3.69	3.63	.31	3.69	2.70	.18	3.69	3.57	.30
SAFETY_INHAB	−0.52	0.26	.0520†	−0.52	0.22	.0230*	−0.52	0.31	.0940†
ARTFUNDS_INHAB	−0.09	0.05	.0590†	−0.09	0.03	.0060**	−0.09	0.05	.0930†
VISWD_INHAB	0.03	0.09	.76	0.03	0.07	.69	0.03	0.07	.72
VISWF_INHAB	0.04	0.12	.74	0.04	0.08	.61	0.04	0.10	.68
ROADS_INHAB	−20.15	20.90	.34	−20.15	25.52	.43	−20.15	28.04	.47
INTERNET_INHAB	0.06	0.50	.90	0.06	0.47	.89	0.06	0.54	.91
FILM_INHAB	0.02	0.03	.55	0.02	0.02	.51	0.02	0.03	.64
FILMCAP_INHAB	7.33	10.40	.48	7.33	14.40	.61	7.33	19.67	.71
FIRMS_INHAB	−113.69	79.30	.16	−113.69	87.96	.20	−113.69	100.55	.26

(Continues)

TABLE 6 (Continued)

	Model 1: Conventional Tobit			Model 2: Robust Tobit			Model 3: Bootstrap		
Category	Coef.	Std. Err.	p value	Coef.	Std. Err.	p value	Coef.	Std. Err.	p value
LABOUR_INHAB	20.62	7.22	.0060**	20.62	7.40	.0070**	20.62	8.20	.0120*
TRAVELAG_INHAB	0.32	0.25	.20	0.32	0.26	.21	0.32	0.28	.25
_cons	0.77	0.05	.0000**	0.77	0.06	.0000**	0.77	0.05	.0000**
Sigma	0.07	0.01		0.07	0.01		0.07	0.01	

**p value < .01;

*p value < .05

†p value < .10

Source: Authors' own.

5 | CONCLUSIONS

Adopting a two-stage procedure, the present work is framed within efficiency evaluation studies exploring tourist destinations, a line of research thus far underdeveloped in the context of Latin America. The originality of the work is boosted by the proposed approach, because a number of concrete factors specifically related to culture have been included amongst the different external variables, which might shape technical efficiency at the second stage. In this way, the goal has been to observe how the accumulated cultural capital and the size of cultural activities might impact on the performance of the regions studied with regard to attracting tourism.

The method used is a two-stage efficiency analysis, which applies non-parametric DEA to calculate the performance ratios and conditioned efficiency through a truncated regression analysis with regard to various contextual variables. The main goal is to ascertain which regions in Chile are more efficient in attracting tourists to stay overnight, and which external variables might impact on said degree of efficiency and in what sense. In order to conduct a comprehensive study of the tourist sector, three models have been considered, discriminating amongst them in terms of the origin of tourist flows, whether total, domestic, or foreign. The study is applied to the 15 regions in Chile and within the time interval spanning 2009 to 2014, which will allow us to establish comparisons between the various geographical areas of the country over time.

The production function that gives shape to the study is managerial, because it relates the number of overnight stays as output, with the accommodation capacity and the tourist flow as input. For its part, the second stage of the analysis considers different external variables by way of a summary of the main heritage elements, natural resources, scope of cultural and creative activity, communication infrastructure, level of security and safety, and so forth.

As for the results, the first point to be highlighted is the high level of mean efficiency, which proves particularly significant in the performance of the Metropolitan Region, together with the regions boasting the main attractions and which have the longest history of holiday tourism; in other words, the coastal regions to the north of the country as well as the regions located to the centre-south, whose main attraction is the inland lakes. As regards the trend over time, we have seen how mean efficiency has slightly fallen in the three models. This might be due to an increase in the availability of accommodation over the last few years, which has, to date, not been reflected in a rise in the number of tourist overnight stays. This is why efficiency is falling rather than increasing.

As regards a comparative efficiency analysis between the various models, we found two kinds of behaviour displaying quite different features. On the one hand, the regions that are more efficient when it comes to drawing domestic tourism are those which boast a whole range of natural attractions such as being on the coast and inland lakes. Contrastingly, in the case of foreign tourists, the best practices are those undertaken by the central regions and the Metropolitan Region, which are the most renowned internationally and are the main entry point into the country for this type of tourism. It is interesting to note how, broadly speaking, the mean efficiency ratio is higher in the case of domestic tourists than in the opposite case. In other words, regions in Chile are more efficient at attracting tourists from the country itself than when drawing foreign tourists who, logically, tend to focus on the most internationally well-known regions.

As for the results to emerge from the second stage, when regressing the previously obtained efficiency ratios, with a total of 17 external variables, we see how those reflecting heritage endowments, as well as the scope and dynamism of the cultural and creative sector, help to increase the regions' efficiency levels when it comes to attracting overseas tourists. This bears out the importance of cultural resources vis-à-vis generating tourist flows, responding to the main goal we sought to test in the present research. Nevertheless, some natural resources and wild areas do have a positive effect on efficiency in the case of domestic tourism. A series of variables also proves significant, interpretation of which might be deemed predictable; the number of crimes yields a negative coefficient, whereas the level of accessibility and communication in the various regions displays a positive one, especially for domestic tourism in the case of the latter.

If we turn to the applicability of the findings, we may conclude that they prove particularly useful within the context of tourism and cultural management as well as with regard to tourism policy. For example, it would seem that certain regions have undergone a slight growth in tourist infrastructure, possibly caused by a recognition of their cultural and natural appeal, but which has not yet been reflected in sufficient tourist flow. Nevertheless, it would also appear that cultural facilities are more efficient at attracting tourism, particularly international tourism. In addition, the study provides an overview of each region's performance and how to zero in on where the main

inefficiencies might lie. One such instance is that of a certain national tourist saturation in the region of Biobío, with another being that of international tourism in the Metropolitan Region. This information could help determine, which measures might be implemented in the area of decision making in the tourist industry for the country as a whole and for the regions.

Finally, it should be highlighted that the innovative nature of the present proposal, justified as it is by the previously referred to lack of similar reference studies both with regard to the context in which it is applied and the approach adopted, means that it may be taken as a benchmark study for Latin America as well as a starting point for carrying out similar works in other contexts on the continent. In addition, it would also prove desirable and understandable to carry out a comparative efficiency study between countries with regard to attracting international tourism, taking the whole of Latin America as a single area, given its cultural idiosyncrasy, even though the latter is diverse in terms of attractions and tourist potential.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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CAPÍTULO 4

Achieving tourist destination competitiveness: Evidence from Latin-American and Caribbean countries

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RESEARCHARTICLE

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Achieving tourist destination competitiveness: Evidence from Latin-American and Caribbean countries

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Abstract

We evaluate tourist efficiency in Latin-America and the Caribbean, an area of growing interest in international tourism. We take 17 countries with homogeneous information for 2011-2015 and apply a two-stage conditioned evaluation. We gauge efficiency using data envelopment analysis of a production function to maximize overnight stays given tourist resources and estimate the impact of external factors for infrastructures, cultural and natural resources, level of development, and so forth. We use a double bootstrap procedure to correct bias in efficiency ratios and serial correlation with second stage variables. We find that countries operate below their possibilities when attracting international tourism. The most efficient are in the Caribbean and Mexico, who specialize in sun and sand tourism. There is evidence that cultural resources and transport infrastructure improve performance. We find the opposite for natural resources and other infrastructures. This research furthers our knowledge of tourist efficiency analysis in an area where such studies remain scarce.

KEYWORDS

cultural economics, data envelopment analysis, Latin-America and the Caribbean, tourism economics, tourist destination performance

1 | INTRODUCTION

Recent years in the field of tourism research have witnessed a growing interest in addressing issues related to measuring efficiency and competitiveness in the tourist industry and tourist destinations from the seminal work of Crouch and Ritchie (1999), to the survey of Sainaghi, Phillips, and Zavarrone (2017). This growing interest is a clear reflection of the sector's ever-increasing importance, which has strengthened its position as one of the pillars of economic development at a world scale (Gwenhune & Odhiambo, 2017). Tourism generates a substantial number of jobs and spawns many firms, boosting the economic activity of the areas where these are located. Added to this is the ever-greater direct economic impact, stemming from tourist spending (Barros et al., 2011) as well as other indirect effects linked to endowments, improved infrastructures, revenue from taxes, investment, and so on. Yet tourism has not only grown in absolute terms but has also become increasingly diversified. New destinations have joined the traditionally available locations, which tended to be confined to Europe or North America (World Tourism Organization Virtual Library [UNWTO], 2015). One example of this is the growing amount of tourism in the Caribbean and South America, where between 2011 and 2015, the number of overseas tourists rose substantially. Panama or Chile have witnessed a growth in excess of 36%, followed by countries such as Colombia or Ecuador where, boasting more modest figures, international tourist arrivals have increased by over 25%. Destinations that until recently attracted an extremely limited type of tourist have begun to receive other kinds of visitors who travel for a variety of reasons, interested in what these locations have to offer in terms of heritage and nature, in addition to work-related, business, or congress purposes (De Vita & Kyaw, 2016). Such development has sparked fierce competition among tourist destinations the world over and is reflected in stakeholder interest in ascertaining which factors drive the sector's development and power to attract tourism and can therefore enhance their competitiveness in the face of their rivals.

Various authors have put forward techniques aimed at quantifying competitiveness, in addition to highlighting the advantages

destinations have to offer as well as pinpointing their disadvantages. One of the principal lines of research seeks to construct competitiveness indicators, prominent among which is the ambitious project launched by the World Economic Forum, known as Travel and Tourism Competitiveness Index, in addition to other contributions that aim to improve methodological approaches (Croes & Kubickova, 2013; Dwyer, Cvelbar, Mihalic, & Koman, 2014; Pulido-Fernández & Rodríguez-Díaz, 2016). For our case, particularly timely are studies that focus on evaluating efficiency in the management and productivity of tourist resources. In this regard, there are numerous references that set out a variety of perspectives and approaches. On the one hand, certain studies explore the agents that make up the sector—hotels or hotel chains—where the productivity analysis responds to a basic input-output structure in the commercial area (Arbelo, Pérez-Gómez, & Arbelo-Pérez, 2016; Assaf & Magnini, 2012; Oukil, Channouf, & Al-Zaidi, 2016). Other authors focus on actual territorial units, in other words, the tourist destinations. This requires the construction of a hypothetical and virtual production function linking the tourist resources these territories possess to the outcomes achieved (Assaf & Josiassen, 2012; Herrero & Gómez, 2017; Soysal-Kurt, 2017). From the methodological standpoint, in order to gauge the performance of this input-output relation, the use of nonparametric methods, principally data envelopment analysis (DEA), is particularly common, given its ability to adapt to multioutput models, to name but one of its advantages (Cracolici, Nijkamp, & Rietveld, 2008; Figueroa, Herrero, Báez, & Gómez, 2017; Hadad, Hadad, Malul, & Rosenboim, 2012). In recent years, however, conditioned efficiency applications have come to the fore, where the use of DEA is complemented with a second-stage analysis, taking into account other external variables that might impact on performance (Bi, Lou, & Liang, 2011; Figueroa et al., 2017; Hadad et al., 2012).

Based on the above premises, the principal objective of our research is to evaluate the tourist performance of a sample of 17 Latin-American and Caribbean countries that are seeking to achieve maximum competitiveness or attractiveness, measured through the greatest possible length of stay, which also involves maximizing the economic impact of tourism flow. We take this area as a virtually homogeneous case study within major tourist destinations at a world scale.[1] For reasons of timeliness and database feasibility, the period between 2011 and 2015 is taken as the timeframe for analysis. The present work's main contribution is based on an innovative proposal in this geographical area of reference, particularly opportune given the relative importance the said area has acquired in recent years in terms of international tourism. Together with this, we propose a model that provides a solution to the possible biases normally attributed to two-stage conditioned efficiency analysis by applying a double-bootstrap procedure. During the first stage, a calculation is made of the efficiency ratios using DEA, the said ratios then being corrected by applying an initial bootstrap in an attempt to secure more consistent estimations. Having obtained the efficiency ratios, the second stage involves observing which external factors might determine tourist performance in these countries through truncated regression analysis. To do this, we take the approach adopted by Simar and Wilson (2007), generating a second bootstrap on the estimations that can thus endow the results with greater robustness, because they offer confidence intervals for the coefficients obtained. As regards the external drivers of efficiency we consider, and based on the main references discussed below, we include variables related to tourist and transport facilities, the state of the country's economy, and level of safety in addition to a series of factors that seek to quantify the importance of the accumulation of cultural and natural resources when attempting to attract greater tourist demand.

The remainder of the article is structured as follows. After this brief introduction to the subject matter, we review the main references in the research field our work forms part of from the methodological and thematic standpoint. The following section then sets out the methodology applied in the research in its theoretical perspective. We then present the case study and the database used and provide a brief descriptive analysis prior to the empirical application. The fifth section discusses the main results obtained before then going on to sum up the conclusions to emerge from our work.

2 | LITERATURE REVIEW

Measuring efficiency in the tourist sector has emerged as an extremely productive line of research in recent decades, as evidenced by the many approaches and techniques applied and which are listed in the bibliometric study of the field carried out by Sainaghi et al. (2017). This work also reveals how frontier methods are the main technique applied, whether using stochastic frontier or DEA. As regards the subject matter, particularly abundant are studies focusing on the efficiency analysis of the tourist sector through its principal stakeholders: hotels, travel agencies, and so forth. In this regard, prominent parametric-type applications include the works of Barros (2004 and 2006), which examine the efficiency of Portuguese inns and hotels, respectively; the study by Bernini and Guizzardi (2010), analysing the efficiency of a broad sample of Italian hotels; the work by Assaf and Magnini (2012) applied to eight chains of hotels in the United States; and Arbelo et al. (2016), who examine Spanish hotels. There are, perhaps, more examples of applications of nonparametric methods, principally DEA, to evaluate aspects of the tourist industry. The bulk of these applications deal with European countries, as is the case of Perrigot, Cliquet, and Piot-Lepetit (2009) for hotel chains in France or the study by Assaf and Cvelbar (2010) for hotels in Slovenia. Prominent among the more recent examples are the contributions made by Fuentes (2011) for Spanish travel agencies and that of Brida, Deidda, and Garrido (2015) focusing on hotels in northern Italy. However, studies exploring non-European contexts are becoming increasingly common, reflecting the diversification of tourist demand. Examples include Untong, Kaosa-Ard, Ramos, and Rey-Maquieira (2011) analysing hotel efficiency in Thailand; Assaf and Agbola (2011) who examine the hotel sector in Australia; Honma and Hu (2012) in Japan; the study by Oukil et al. (2016) for the case of Oman in the near east; or finally the study by Mendieta-Peñalver,

[1]Taking into account geographical demarcation criteria, we feel this to be a homogeneous group of countries, which are alike in terms of being a tourist destination and even for reasons of shared cultural identity, despite the fact that the sample does embrace certain diversity with regard to size and the specialization of the countries that make up the group.

Perles-Ribes, Ramón-Rodríguez, and Such-Devesa (2016) dealing with a chain of hotels that operates at an international level.

In contrast to studies focusing on evaluating the hotel and tourist sector, the main references for our work are studies addressing tourist destinations, in other words, territorial demarcations, and that attempt to gauge their performance in terms of their capacity to attract tourism and to extend tourists' stay, which expresses the main source of tourist expenditure and, therefore, economic impact. The different methodological approaches in this area are summed up in Table 1. Such approaches are grounded on the concepts developed by Crouch and Ritchie (1999) for territorial tourist production functions. In these instances, areas are analysed as if they were a trading company. In other words, from a hypothetical perspective, tourist destinations, cities, regions, or countries are examined in order to determine to what extent they are able to manage their resources or inputs, in a virtual production function, in the most efficient manner possible so as to maximize tourist stays and thus boost their competitiveness compared with other rival destinations. As stated by Benito et al. (2014), the primary objective pursued by regions is to maximize their tourist appeal and the economic impact generated by tourist flow. A good proxy variable for measuring this is, therefore, length of stay. Botti, Peypoch, and Solonandrasana (2008) take this argument further by relating length of stay and tourist satisfaction, which is related to the kind of attractions tourists will find and enjoy during their stay. Therefore, length of stay is the appropriate variable with which to analyse tourism attraction in our context, because it proves highly relevant for the expenditure generated, given the number of arrivals. A complementary analysis may then be conducted of the external variables that might determine the level of efficiency and length of stay, such as the various cultural and natural attractions, communication infrastructure, and safety.

Prominent in this line of research are studies assessing efficiency at a regional scale, such as those of Cracolici et al. (2008) and Suzuki et al. (2011); both of which deal with Italian regions, or those of Botti, Peypoch, Robinot, and Solonandrasana (2009) and Barros, Botti, Peypoch, Robinot, et al. (2011), for French tourist destinations. Based on a more specific approach, Cuccia, Guccio, and Rizzo (2016) examine how efficient Italian regions are at attracting tourism by analysing the influence of cultural endowments, specifically the presence of a greater number of UNESCO listed sites. Benito et al. (2014) apply a similar study to Spanish regions, and more recently, Herrero and Gómez (2017) again assess tourism in Spain, focusing particular attention on the conditioning effect caused by the accumulation of cultural resources. Although, as we have pointed out, most studies in this field are carried out at a regional scale, another group of works explore efficiency on broad samples of countries at a continental or even world scale. According to Assaf (2012), such an approach offers major advantages and applications, because it enables comparisons to be made between the performances of actual competitors. Examples include Soysal-Kurt (2017), who posits an efficiency analysis using DEA for a sample of European countries, whereas Assaf and Josiassen (2012) and Hadad et al. (2012) broaden their focus to a world scale.

In the case of Latin-America and the Caribbean, the focal point of our research, references are far more scant. Efficiency studies in the tourist sector using frontier methods have received little attention in this corner of the world, added to which most of the existing works have confined themselves to adopting a regional approach. To date, we are only aware of the work by Figueroa et al. (2017), applied to the case of Chile and based on the two-stage efficiency method. Other studies addressing issues related to tourism and efficiency, albeit tangentially, are the work by Román and Font (2014) into tourist policy and sustainability in Chile, and Del Río (2015) who examines tourist demand in the Chilean region of Maule. Finally, there is the research by Pérez, Guerrero, Pérez, and Caballero (2014) into efficiency and natural destinations on the island of Cuba in which DEA is used, although it is applied to construct a synthetic indicator. For this reason, our work is both innovative and timely in that there are few studies evaluating the efficiency of tourist destinations in the area in question, an area whose importance in terms of its capacity to attract international tourism is growing by the minute. Nor are we aware of any study that adopts the technique proposed here of two-stage evaluation for territorial disaggregation in the form of countries for this part of the world.

TABLE 1 Main efficiency evaluation studies of tourist destinations

Author	Case study	Model
Cracolici et al. (2008)	103 Italian regions	DEA-CRS-output oriented
Barros, Botti, Peypoch, Robinot, et al. (2011)	21 French regions	DEA-CRS-VRS-output oriented-Second Stage-Bootstrap procedure (Simar & Wilson, 2007)
Suzuki, Nijkamp, and Rietveld (2011)	103 Italian regions	DEA-CRS-input oriented
Hadad et al. (2012)	105 countries	DEA-CRS-output oriented
Assaf and Josiassen (2012)	120 countries—2005-2008	DEA-VRS-input oriented-Second Stage Bootstrap procedure (Simar & Wilson, 2007)
Benito, Solana, and López (2014)	17 Spanish regions	DEA-CRS;VRS;NIRS-output oriented-Second Stage Bootstrap procedure (Simar & Wilson, 2007)
Herrero and Gómez (2017)	17 Spanish regions	DEA-CRS-output oriented-Bootstrap-Second Stage
Soysal-Kurt (2017)	29 European countries	DEA-CRS-input oriented
Figueroa et al. (2017)	15 Chilean regions	DEA-CRS-output oriented-Bootstrap-Second Stage

Source: Authors' own.

3 | METHODOLOGICAL APPLICATION: TWO-STAGE CONDITIONED EFFICIENCY

This research posits an efficiency analysis of a sample of Latin-American and Caribbean countries using DEA two-stage double bootstrap analysis. During the first stage, we aim to obtain the technical efficiency ratios in tourism management of the countries analysed, using the DEA technique. In the second stage, we apply a regression analysis in which we include the efficiency ratios to emerge from the first stage as the dependent variable and a whole range of external factors that might determine the level of efficiency attained by each country as the independent variables. Specifically, we adopt the approach put forward by Simar and Wilson (2007), based on a truncated regression with double bootstrap, which provides more robust estimations and eliminates the main biases attributed to traditional two-stage efficiency. As Jebali, Essid, and Khraief (2017) sum up, the following three points should be taken into account when conducting this type of analysis: that the outcome of the efficiency is not real, in other words, it is not observed but is the result of empirical estimation; efficiency may also depend on other variables not taken into consideration during the first stage, meaning that the error term may be correlated with the explanatory variables from the second stage; and finally, that the variable resulting from calculating the efficiency is truncated between 0 and 1, a fact that should be borne in mind during the second stage of the analysis. In this way, the technique developed by Simar and Wilson (2007), specifically their Algorithm 1, solves many of the bias-related issues, because it constructs a confidence interval both in the efficiency ratios and regression coefficients.

In the first stage, the most common method for quantifying performance or efficiency is the nonparametric DEA model. This was developed by Charles, Cooper, and Rhodes (1978), based on the fundamental precepts previously set out by Farrell (1957). Conceptually speaking, DEA is a nonparametric frontier method used to gauge the level of efficiency within a group of units by calculating an envelope with those units that evidence the best practices and their linear combinations. As a result, units falling below the frontier will be deemed nonefficient. The principal advantage of this technique is that there is no need to specify the form of the production function, because it bases its calculations on the information available, resolving a simple problem of optimization. Nevertheless, as do all techniques, it suffers from certain disadvantages that should be taken into account in an effort to minimize them (see Dyson et al., 2001). The main disadvantage involves the need to be particularly meticulous when selecting the units considered, because they must display a significant level of uniformity within diversity so as to avoid possible biases in the estimations (Martínez, 2003). DEA is based on designing a production function in our case study for territorial entities that contain the resources or inputs that, when combined, generate a series of outputs. In line with our definition of the subject matter, from a hypothetical standpoint, this means that countries are capable of handling their tourist resources (accommodation capacity and flow of international arrivals) so that they can maximize their output (length of stay, measured through the number of overnights stays).

When positing an efficiency analysis using DEA, it is necessary to establish a series of assumptions concerning the model. First, we formulate an orientation aimed at maximizing output because we feel that this fits in better with how we set out our production function (maximizing overnight stays based on given tourist resources), and this is indeed how it is used in other works, which adopt a similar approach (Assaf & Agbola, 2011; Assaf & Cvelbar, 2010). A decision must also be taken with regard to returns to scale. In our case, we adopt the method proposed by Banker, Charnes, and Cooper (1984) of using variable returns to scale (VRS) as opposed to constant returns to scale (CRS) so that the model can reflect the differences in size seen between the countries. Furthermore, bearing in mind how small the sample is, we use panel data with a total of 85 observations (17 countries in 5 years). Taking all of the above into account, the model on which this stage of the empirical application is based is as follows:

$$\begin{aligned} &\max_{\theta;\lambda}\lambda \\ &\text{st } \lambda y_{im} \leq \sum_{k=1}^{c} \gamma_k\, y_{mk};\ m = 1...;\ M; \\ &\textstyle\sum^{C}_{k=1}\gamma_j x_{kn} \leq x_{in};\ n = 1...;\ N; \\ &\gamma_i \geq 0;\ i;\ k = 1;\ C; \end{aligned} \tag{1}$$

where C is the number of countries that make up the sample, $x \in R^N_+$ and $y \in R^M_+$ are the input and output vectors corresponding to country i, γ is a weight vector C × 1, and λ is a scalar. Bearing in mind that λ will take a value greater than or equal to 1, and that λ-1 is the proportional increase in output that could be achieved by country ith with constant amounts of input quantities held constant. The value 1/λ is the result of technical efficiency, which varies between 0 and 1. The previous formula is resolved C times, once for each country in the sample.

Based on the improvement described by Simar and Wilson (2007), the model is complemented by applying the bootstrap procedure and, as is common when using this technique, a total of 2,000 iterations on the efficiency results (Barros, Botti, Peypoch, Robinot, et al., 2011; Simar & Wilson, 2000). This procedure tests the robustness of the estimations and is particularly appropriate because it rules out possible biases (Fang, 2013).

As regards the second stage, the technical efficiency of the countries analysed is deemed to be affected by contextual variables that determine its production process. These are external factors that do not form part of the actual production process but do define it, such that including it in the model allows possible inefficiencies to be pinpointed. In our case study, we mainly include endowment variables of infrastructure, socio-economic factors and resources, or tourist attractions. The results allow us to ascertain which variables do actually impact on performance in tourist management in Latin-American and Caribbean countries, to what extent they do so, and whether the effect helps generate an environment that is conducive to efficiency or whether, on the other hand, they generate a negative environment.

Based on the above, we posit a regression analysis in which the efficiency ratios generated during the first stage are included as a dependent variable and so-called contextual variables or external factors are included as explanatory variables, in accordance with the following:

$$\theta_k = \beta x_k + \varepsilon_k; \tag{2}$$

where $\varepsilon_k \sim N(0, \sigma^2)$, and β is a vector of parameters for the series of independent variables x_k. As pointed out earlier, these variables are socio-economic characteristics in addition to others related to tourist infrastructure and endowments of major natural and cultural resources. In order to solve Equation (2), models such as ordinary least squares or Tobit regressions are unsuitable because they fail to prevent correlation between the efficiency outcomes and the error term ε_k. This is why we use the truncated regression model proposed by Simar and Wilson (2007, pp. 41-42) for which, once we have extracted the efficiency ratios based on formula (1), we apply maximum likelihood in order to obtain a $\hat{\beta}$ for β and a $\hat{\sigma}_\varepsilon$ for σ_ε in the truncated regression of $\hat{\theta}_k$ in x_k within (2) using the subsample of inefficient DMUs, in other words with outcomes below 100. The calculation of estimations L bootstrap for β and σ_ε is then carried out as follows:

1 For each inefficient country, we draw ε_k of a normal distribution with variance σ_3^2 and left truncation in $1-\beta x_k$ and $\theta^* = \beta x_k + \varepsilon_k$ is calculated.

2 We then estimate the regression of θ^* in x_k by using maximum likelihood, generating a bootstrap estimation $(\beta^*, \sigma_\varepsilon^*)$.

Finally, the posited bootstrap repetitions are carried out. In this case, there are 5,000, thus allowing confidence intervals for β and σ_ε to be constructed. The outcomes of this model enable us to draw conclusions that explain the possible suboptimal behaviour seen during the first stage.

4 | CASE STUDY

Our case study comprises a sample of 17 countries spread over the Caribbean and South America and is determined by data availability; these are Argentina, the Bahamas, Belize, Bolivia, Chile, Colombia, Cuba, Ecuador, Guatemala, Jamaica, Mexico, Nicaragua, Panama, Peru, Dominican Republic, El Salvador, and Uruguay. It is a geographically homogeneous area both in terms of cultural uniqueness and as regards its clearly defined distinctness within international tourist destinations. Yet there is a certain disparity in the size of the countries and vis-à-vis their differing tourism specialization, a problem we seek to overcome by adopting a pertinent methodological approach that considers VRS in the efficiency analysis, and taking into account various contextual variables in the regression analysis to explain possible efficiency deficits. With regard to the time window considered, the 5 years between 2011 and 2015 are covered,[2] based on the information gathered in the so-called UNWTO.[3] Given the sample size and in an effort to make the estimations more robust, a balanced panel of data is constructed containing 85 observations (17 countries and 5 years), on which a two-stage conditioned efficiency analysis is conducted. Table 2 provides a short description of the variables used in the study, the three that make up the first stage and the nine included in the regression analysis, together with the origin of the data and the main descriptive statistics.

In order to answer the main question on which our work is structured, namely, efficiency in tourist destination management in Latin-America and the Caribbean, we need to posit a production function as a fundamental element of the methodological development. In our case, a distinction is drawn between two inputs and one output as done by others such as Barros, Botti, Peypoch, Robinot, et al. (2011) and Benito et al. (2014), adopting a totally managerial approach. Thus, on the side of the inputs, we consider an approximate variable of the capital factor of the tourist industry, in terms of the available accommodation capacity in each country, in other words, the total number of beds in hotel establishments (Beds). Also taken into account is the flow of overseas visitors coming into the country to engage in tourist activities (Arrivals), regardless of their motivation and who stay for at least one night. On the output side, we select the principal variable available that allows us to measure tourism's actual impact on the country, the number of nights that overseas tourists stay in the country of destination (Overnight stays). As pointed out in the work of Barros, Botti, Peypoch, Robinot, et al. (2011), although arrivals and overnight stays may a priori be seen as similar concepts, it should be noted that overnight stays reflect the actual impact generated by tourists, whereas arrivals merely reflect flows. A country may thus evidence a high number of tourist arrivals yet display a low number of overnight stays, thus evidencing inefficient tourist destination performance, because the actual economic impact is lower. The posited production function thus shows the concept through which we measure tourist destination efficiency: Tourist destinations that, given certain resources (arrivals and accommodation capacity), are maximizing the duration of their visitors' stays and therefore prolonging the economic impact generated in the country of destination (De Oliveira, Ramos, & Rey-Maquieira, 2014), are deemed to be more efficient.

With regard to the second stage, we take into account a whole range of external variables in an effort to sum up the main factors that might create the right conditions for generating greater tourist management efficiency or, in contrast, might compromise destinations' performance and competitiveness. In addition to the variables considered, it would be interesting to compare other kinds of factors related to political management, prices in the tourist sector, domestic tourism, distance from the main markets, and so forth. However, the unavailability of homogeneous data for the 17 countries prevents the model from being extended to explanatory variables. Within the information available, we select a total of nine variables, which have in turn been grouped into four blocks.

4.1 | Block 1: Cultural and natural resources

It is common in the literature to see how tourist destination performance is determined by the presence of cultural and natural resources (Cuccia et al., 2016; Herrero & Gómez, 2017; Ribaudo & Figini, 2016). Accumulating such resources affords tourist destinations a

[2]During the time window analysed, Latin-America and the Caribbean suffered the effects of the world economic crisis, which halted the boom period experienced during the previous decade and which no doubt also impacted on foreign tourist, and principally European, arrivals. Nevertheless, this period did witness the consolidation of economies in this area, as was the case of Chile or Colombia, whereas Argentina underwent a major recession with also the devaluation of its currency. These circumstances might also have affected their capacity to attract overseas tourism, as shall be seen later (Figure 1).

[3]Information available for consultation upon payment at http://www.e-unwto.org/toc/unwtotfb/current

TABLE 2 Descriptive statistics of the variables

Variable	Description	Source	Mean	Std. Dev.	Min	Max
Arrivals	Arrivals of international tourists who stay at least one night.	UNWTO	3,185,663	4,611,080	234,030	29,346,000
Beds	Total available accommodation capacity in hotel facilities and other tourist lodgings.	UNWTO	217,770	331,743	12,058	1,473,024
Overnight stays	Total overnight stays by international tourists in the country in hotel facilities and other tourist lodgings.	UNWTO	19,361,042	35,931,565	856,000	177,000,000
Cultural heritage	UNESCO Declarations of Material and Immaterial Cultural Heritage. Accumulated figures.	UNESCO	7.094	8.567	0	37
Natural heritage	UNESCO Declarations of Natural Heritage. Accumulated figures	UNESCO	1.517	1.701	0	6
Protected areas	Percentage of land and maritime areas protected by the government of each country.	World Bank	10.204	7.653	0.51	24.83
Per capita GDP	Total annual gross domestic product per inhabitant at constant prices. In international dollars.	CEPAL	7,586.72	5,048.40	1,603.33	22,050.2
Safety	Number of murders per 100,000 inhabitants.	World Bank	21.20	15.52	25	72.2
Airline departures	Departures of airline companies registered in each country per 1,000 inhabitants.	World Bank	23.55	60.96	0	334.19
Internet	Percentage of inhabitants with internet access.	World Bank	41.59	15.85	10.6	78.0
Dummy Island	Dichotomous variable which takes the value 1 when the country in question is an island and the value 0 otherwise.	Own	0.23	0.43	0	1
Trend	Time factor indicating the years studied in the sample. It takes the value 1 in 2011 and increases up to the value 5 in 2015.	Own	3	1.42	1	5

Source: Author's own.

comparative advantage (Hadad et al., 2012; Oukil et al., 2016), enhances their visibility on the tourist scene, diversifies the possible motivations for attracting different groups of consumers, and thus helps place the tourist destination in question in a more competitive and efficient position. In this regard, we include three well-differentiated variables: UNESCO declarations of cultural heritage (material and immaterial) and their equivalent in the area of natural heritage, encompassing those cultural and material elements that are most renowned and prestigious at an international level. Not only do we consider the number of declarations but also introduce accumulation over time, because the older the declaration, the more it might impact on the ability to attract. We also deemed it appropriate to include another variable that reflects the various countries' national wealth, not only those considered by UNESCO, because this might be one of the main attractions of the destinations in this area (Lee & Jan, 2017). As a result, we included each country's percentage of natural areas protected by the national authorities relative to the country's total surface area.

4.2 | Block 2: Socio-economic situation

As pointed out by authors such as Assaf and Josiassen (2012) and Bi et al. (2011), variables related to economic development and level of income or questions related to health or safety are certain factors that are indicative of the progress of areas such as the tourist industry. This is why in our work, we considered variables such as per capita GDP as a factor linked to the wealth and economic situation of the country. We also included another variable, safety, which allows us to gauge the level of violence in each of the countries in the sample, something which the majority of authors feel to be a driver of tourist demand (Assaf & Josiassen, 2012; Crouch & Ritchie, 1999; Herrero & Gómez, 2017). Given the information available, we took the number of murders per 100,000 inhabitants as a variable approximating safety.

4.3 | Block 3: Infrastructure

The quality of a country's infrastructure is often seen as being closely linked to how efficient the said country is at attracting tourism (Hadad et al., 2012). Given the importance that the number of arrivals by air (as opposed to by sea or land) has for international tourism, we consider the variable known as airline departures, which includes flight departures of airline companies registered in each country, both domestic or foreign. This variable not only provides us with information concerning potential passenger movements but also indicates the tourist management capacity of the country's own airline companies. We also include the percentage of individuals with Internet connection, a variable used as a benchmark of the destination country's level of communications and technological development (Figueroa et al., 2017).

4.4 | Block 4: Other indicators

By using the variable known as dummy island, we include a control element to reflect the possible effect generated by noncontinental tourist destinations, which in this case, study and, particularly in the area of the Caribbean, often attract a very specific kind of tourism related to resort type accommodation and the so-called sun and sand as well as honeymoon tourism, studied in works such as Kim and Agrusa (2005).

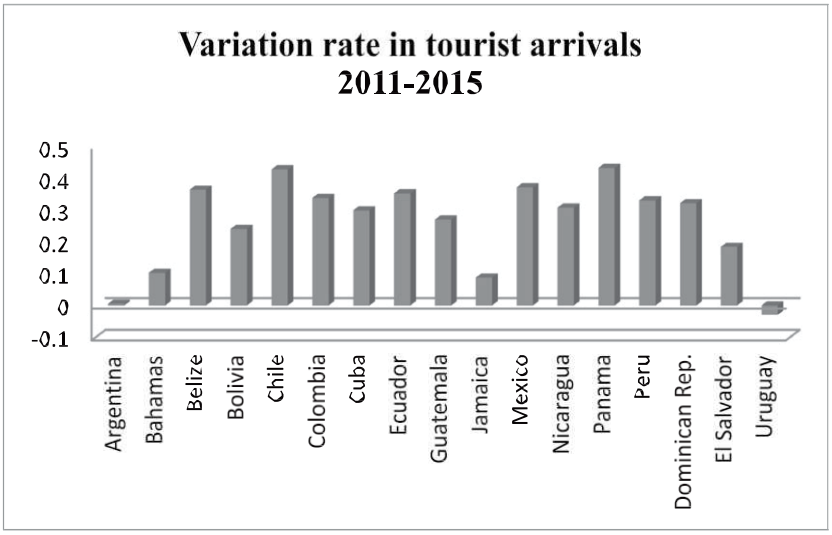


FIGURE 1 Variation rate in tourist arrivals 2011-2015

Source: author's own

In this final block, we include a variable that allows us to consider the time lapse as a determining factor, trend, and takes the value 1 in 2011 and increases to 5 in 2015. It has been used by Barros, Botti, Peypoch, and Solonandrasana (2011) among others. This allows us to observe a dynamic effect and to ascertain whether the destinations examined are progressing towards greater efficiency or whether, by contrast, they have already reached maturity.

Having presented the database that provides the grounding for the empirical application, a brief description should here be given of the data used in order to properly contextualize the current situation of the tourist sector in our area of study. This will later allow us to examine in greater depth the outcomes to emerge from the analysis of efficiency and the external drivers.

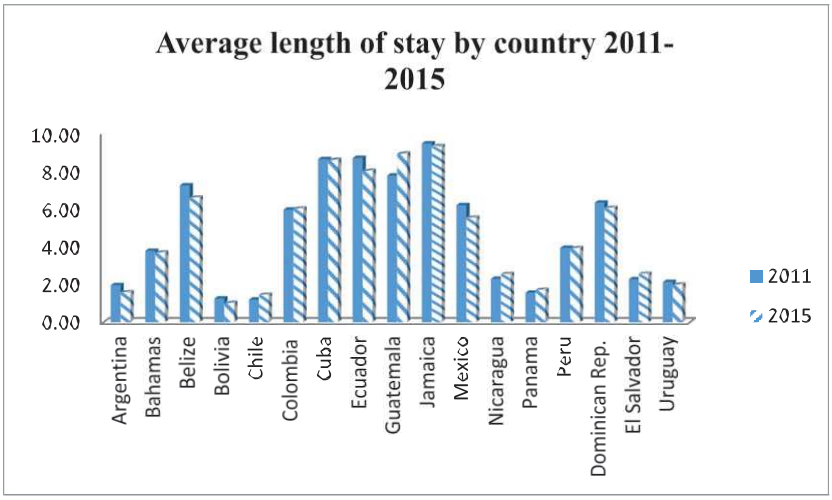
As pointed out previously, international tourism in this part of the world is clearly expanding. According to our database (UNWTO, 2015), the accumulated number of international tourist arrivals in the 17 countries that make up the sample has increased by 26% in only 5 years. The figure rose from around 58 million in 2011 to over 75 million in 2015. This area concentrates 8% of all international tourist arrivals, which means it is the third ranked tourist destination in the world after Europe and the Asia-Pacific area. As for the data in terms of countries, the number one destination for international tourists is Mexico,[4] which boasts a much higher figure than other countries such as Argentina or the Dominican Republic. Standing out at the other end of the scale, in other words, among the countries that welcome the lowest number of international tourists, is Belize, which ranks bottom of the list, having received fewer than 300,000 tourists in 2011 and less than 500,000 in 2015, whereas Bolivia received fewer than a million in both years.

It is, however, interesting to look at the variation rate for tourist arrivals between 2011 and 2015 by countries. Figure 1 shows which countries have witnessed the highest growth in the number of international visitors. The country evidencing the greatest increase is Panama, which, despite only welcoming a relatively small number of arrivals, recorded a 43% variation. Figures are similar for Chile, which saw a growth of over 40%. One interesting case is that of Mexico, a country that witnessed a 37% variation, placing it third in the ranking in terms of highest growth. This is coupled with the fact that it is the country to record the biggest number of arrivals, thus reflecting how healthy its tourist sector is at the moment. Despite being the country with the smallest number of visitors, Belize is, however, undergoing a period of expansion, because in relative terms, its appeal as an international tourist destination grew by over 34%. This contrasts with Argentina, a country that seems to be going through a period of stagnation, because its variation rate is close to zero, together with Uruguay, the only country to display a downward trend in terms of international tourist arrivals.

As regards the analysis of overnight stays of international tourists, these are relative to arrivals, in other words, as average length of stay in each country (Figure 2), which gives us a real idea of the duration of tourist stays at the destinations considered. It should first be pointed out that the accumulated trend in the sample is slightly downward, because it slipped from an average of 4.74 overnight stays in 2011 to 4.67 in 2015. If these figures are placed alongside the data shown in Figure 1, it can be seen that the sector is growing in terms of the number of visitors but that the average stay is getting slightly shorter. Prominent in this regard are the particular cases of Jamaica, Cuba, and Ecuador, which are the countries with the highest average number of overnight stays, all above eight. At the other end of the scale are Bolivia and Chile, both with short duration stays of less than two nights. Low figures are also apparent for Panama, El Salvador, Uruguay, and Argentina.

Broadly speaking, it can be seen that tourism in the Caribbean and Latin-America has been showing a positive trend over the last few years. The area is attracting a growing number of international visitors each year added to which the average number of overnight stays is high. This growth is being driven by countries that are traditionally popular with tourists, such as the Dominican Republic and particularly Mexico, the leading country in terms of the main variables considered. However, it is interesting to note the emergence of new tourist destinations, as evidenced by the dynamic analysis of the variables. Good examples of this are countries such as Ecuador, Panama, and Belize.

[4]According to the World Tourism Organization, in 2015, Mexico is the ninth-ranked country in the world in terms of the number of tourist arrivals.



Source: author's own

FIGURE 2 Average length of stay by country 2011-2015 [Colour figure can be viewed at wileyonlinelibrary.com]

5 | EMPIRICAL ANALYSIS: TWO-STAGE CONDITIONED EFFICIENCY

We now present the results of applying two-stage conditioned efficiency analysis to the sample of 17 Latin-American countries for the period 2011 to 2015. It is important to point out that a data panel has been applied in order to generate more robust estimations, both for the first and the second stage. In other words, countries are considered as independent units in each year of the sample. This allows us to observe the efficiency of the units and also to conduct a dynamic analysis of how the results have progressed.

5.1 | Efficiency analysis results of tourist destinations in Latin-America and the Caribbean

This work's main hypothesis assumes that, from the standpoint of tourist management, countries are seeking to achieve the highest possible efficiency or competitiveness. In line with our approach, this is reflected by attempting to maximize the duration of international tourists' stays, which we quantify through the overnight stay variable and which would result in increased total spending and, therefore, affect the economic impact of tourism. In order to evaluate this competitiveness, we posit a strictly managerial production function: For each country, we measure the output, number of overnight stays (as a proxy of the economic impact from tourism), based on tourist inputs or resources, accommodation capacity (capital factor), and arrivals (tourism flow). This enables us to establish conclusions with regard to the competitiveness of tourist destinations in the Caribbean and Latin-America, in this case measured by applying technical efficiency in the use of tourist resources. In methodological terms, we employ the DEA model, which in turn is complemented with a bootstrap procedure in order to amend the problems usually attributed to this technique, resulting from its deterministic nature, an issue that will be discussed in greater detail later.

Before performing the calculations, a description should be provided of this model within the framework of the different alternatives offered so as to adapt it to the characteristics of the question being analysed. First, a decision needs to be taken regarding the technological hypothesis. In this case, we opted for VRS, given that our aim is simply to measure pure technical efficiency, assuming that this is merely attributable to management related issues. It also enables us to offset possible problems of diversity in the size of the countries analysed and facilitates comparisons between countries that have different size tourist industries (Assaf & Josiassen, 2012). With regard to the model's approach, as already pointed out and taking the hypothesis on which we define competitiveness, we opt for maximization of output. As stated by Barros, Botti, Peypoch, and Solonandrasana (2011), who apply a similar production function, adopting the opposite approach would not make sense, because reducing the input of tourist arrivals would run counter to the goal of maximizing overnight stays. Table 3 shows the results of calculating conventional efficiency,[5] carried out under the previously mentioned assumptions and breaking it down into countries and years. However, as pointed out in the study by Simar and Wilson (2007, pp. 38), these results might display a significant bias that should not be overlooked and that should be corrected by applying a bootstrap procedure, through which we obtain a confidence interval for the result, in our case, at 95% and with a total of 2,000 iterations.

The results to emerge from this new model are shown in Table 4, which sums up for each country the mean efficiency with the original estimation (DEA-VRS), the mean results after correction for bias (DEA-VRS-BOOTSTRAP), and finally the mean bias resulting from the difference between the two calculations. These results show the overestimation that occurs when failing to take bias into account, with a mean efficiency of 52.4% being obtained, whereas once this has been eliminated, efficiency drops by almost three percentage points, falling to an average of 49.5%. It can be stated that, in light of these results, the countries in our sample manage their tourist sector 50.5% below their possibilities, which shows that there is ample room for improvement. These results are complemented with those displayed in Table 5, where it is possible to analyse by years the mean

[6]Due to the lack of uniform data for all the countries in the sample, it was not possible to include the domestic tourism variable in the second-stage study, despite its potential capacity to explain inefficient behaviour.

TABLE 3 Efficiency ratios by countries. Variable returns to scale model

Country	2011	2012	2013	2014	2015	Mean
Argentina	13.44	12.04	10.81	11.22	9.83	11.47
Bolivia	11.18	9.29	9.46	8.72	8.44	9.42
Chile	11.04	11.78	11.97	15.59	16.08	13.29
Colombia	47.27	46.66	49.5	52.16	52.11	49.54
Cuba	85.8	89.55	90.7	89.81	100	91.17
Ecuador	42.79	39.8	38.72	41.06	40.52	40.58
Mexico	100	89.2	92.89	100	100	96.42
Panama	16.64	20.56	24.17	21.83	17.87	20.21
Peru	18.2	22.72	25.14	21.58	20.98	21.72
Uruguay	36.52	54.25	44.54	42.79	42.26	44.07
Jamaica	99.91	100	99.36	100	100	99.85
Nicaragua	61.09	54.84	49.07	48.15	49.03	52.44
Bahamas	49.38	55.14	51.32	50.82	55.09	52.35
Belize	100	100	97.25	93.84	90.67	96.35
El Salvador	90.82	64.23	77.68	94.87	88.5	83.22
Guatemala	43.85	44.49	43.71	37.87	56.14	45.21
Dominican Rep.	74.39	75.44	77.19	83.29	91.46	80.35
Mean Efficiency	53.08	49.61	49.75	51.22	52.83	50.78
No. of efficient DMUs	2	2	0	2	3	0

Source: Author's own.

TABLE 4 Mean variable returns to scale (VRS) efficiency before and after bootstrap 2011-2015

Country	Mean DEA-VRS	Mean DEA-VRS-BOOTSTRAP	Mean bias
Argentina	11.47	10.26	1.21
Bahamas	52.35	48.65	3.69
Belize	96.35	93.19	3.16
Bolivia	9.42	8.88	0.53
Chile	13.29	12.51	0.78
Colombia	49.54	46.89	2.65
Cuba	91.17	86.14	5.03
Ecuador	40.58	37.03	3.55
Guatemala	45.21	42.40	2.81
Jamaica	99.85	99.71	0.15
Mexico	96.42	93.56	2.86
Nicaragua	52.44	49.52	2.92
Panama	20.21	18.57	1.64
Peru	21.72	19.52	2.20
Dominican Rep.	80.35	76.77	3.58
El Salvador	83.22	78.54	4.68
Uruguay	44.07	41.11	2.96

Source: Author's own. Results obtained using the PIN-DEA programme with 2,000 bootstrap replicas.

efficiency before and after correcting for bias. It can be clearly seen how, after 2012, efficiency grows slowly but surely, reaching its peak in 2015, when mean efficiency reaches 52.83%, once bias is corrected for. It is also possible to quantify the fact that efficiency grows between 2011 and 2015 by just over two percentage points. In Section 2, it was stated that in general terms, the number of tourists arriving had increased significantly in these countries, whereas if we speak in terms of mean overnight stays, the figures drop slightly. This effect is reflected by the slight increase in efficiency obtained as a result. Although these countries are attracting a growing number of tourists, they are not managing this resource well in terms of maximizing the number of overnight stays, in other words, boosting their competitiveness.

A more detailed analysis by countries is provided graphically in Figure 3. There is quite a notable pattern in geographical terms, in which countries in the Caribbean evidence a mean accumulated efficiency level of 72.12%, whereas for those in South America, the figure is only 25.26%, taking the results from 2015 as a reference. This efficiency ratio, which is extremely low in the case of South American countries, might be due to our not having considered domestic tourism in our study, because part of these countries' resources aim to cater for domestic tourism demand. This factor might have proved to be quite important in countries with higher levels of economic development such as Chile, Argentina, and Uruguay.[6] It should also be borne in mind that in countries in the Southern Cone there is, broadly speaking, a greater flow of proximity international tourism, in other words, between neighbouring countries, which might be reflected in shorter stay periods given the shorter distances between country of origin and destination.

A more detailed analysis reveals that the tourist destination that most efficiently manages international tourism is Mexico, which is located on the efficient frontier in three of the years and displays a mean efficiency of 99.71% during the period. As previously seen, Mexico boasts the highest figures in the main variables and, according to the model applied, is the country that best manages its resources, maximizing the desired output by almost 100%. In addition to Mexico, five other countries evidence an extremely high mean efficiency: Belize, Jamaica, El Salvador, Cuba, and the Dominican Republic; almost all of which share the appeal of being located in the same area of the Caribbean. Particularly worthy of note is the case of Belize, because its tourist sector is at the other end of the scale to Mexico in terms of size yet which, based on its resources, is maximizing its competitiveness, although it is slipping back.

Another notable feature is countries evidencing appreciably low efficiency ratios, as is the case with Chile, Bolivia, and Argentina; all of which are below 20%. Bearing in mind the absolute values, Bolivia is a country with a low international tourist appeal, exhibiting a small number of arrivals and overnight stays in addition to which it is managed below its possibilities. However, it can be seen to display a positive trend, albeit not too significant, in terms of management progress in its tourist sector. The other two cases, Chile and Argentina, are countries that welcome a considerable number of international tourists and in fact lead the continent. Nevertheless, they are not very efficient when it comes to managing the sector and are a long way from maximizing their output. Here is where it can be seen that part of their tourist infrastructure is geared towards catering to domestic tourist demand. In the middle of the mean efficiency levels in the sample

[6]Due to the lack of uniform data for all the countries in the sample, it was not possible to include the domestic tourism variable in the second-stage study, despite its potential capacity to explain inefficient behaviour.

TABLE 5 Descriptive statistics of the efficiency ratios 2011-2015

		Mean	Std. Dev.	Min	Max
2011	DEA-VRS Efficiency	53.08	33.32	11.04	100.00
	DEA-VRS-BOOTSTRAP Efficiency	50.50	33.08	10.29	100.00
2012	DEA-VRS Efficiency	52.35	30.86	9.29	100.00
	DEA-VRS-BOOTSTRAP Efficiency	49.61	30.13	8.76	100.00
2013	DEA-VRS Efficiency	52.56	31.29	9.46	99.36
	DEA-VRS-BOOTSTRAP Efficiency	49.75	30.33	8.94	98.72
2014	DEA-VRS Efficiency	53.74	33.23	8.72	100.00
	DEA-VRS-BOOTSTRAP Efficiency	51.22	32.61	8.24	100.00
2015	DEA-VRS Efficiency	55.23	33.98	8.44	100.00
	DEA-VRS-BOOTSTRAP Efficiency	52.83	33.68	7.98	100.00

Source: Author's own.

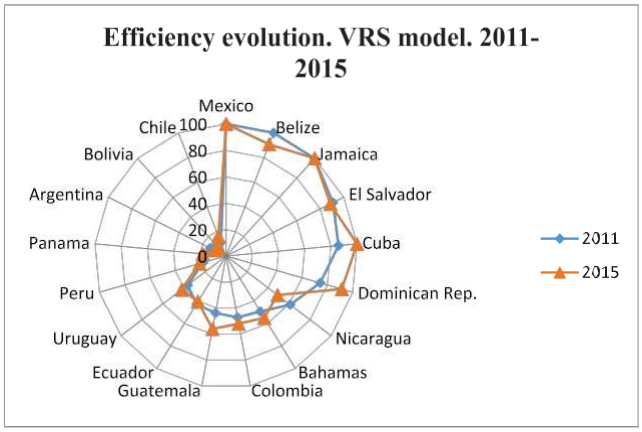


FIGURE 3 Efficiency evolution. Variable returns to scale (VRS) model 2011-2015 [Colour figure can be viewed at wileyonlinelibrary.com]

are countries such as the Bahamas, Colombia, Nicaragua, and Guatemala, which also receive their share of Caribbean sun, sand, and sea tourism, but which also boast major cultural and natural tourist attractions.

5.2 | Results regression analysis of external factors

We now apply the second-stage model proposed by Simar and Wilson (2007) to evaluate the hypothesis that the efficiency of countries in South America and the Caribbean, in the period between 2011 and 2015, is shaped by a series of external factors. We assume that these factors can impact on the efficiency achieved in the production process, whether positively, by generating a context that enhances competitiveness or negatively by causing delays or limitations. However, the said factors have not been included in the initial production function so as not to overextend the number of inputs and complicate DEA analysis. As a result, the first stage is confined to assessing the technical efficiency of the relation between accommodation capacity, tourist arrivals, and number of overnight stays. In contrast, during the second stage, we do examine the impact of external factors in this relation. As pointed out in Section 3, the chosen variables address issues related to natural and cultural heritage, the country's socio-economic situation, tourist infrastructure, and level of development, as well as other issues related to geographical and dynamic aspects. The model is estimated using truncated regression, following Algorithm 1 of Simar and Wilson (2007), in which we include the result of the efficiency ratios in the DEA VRS BOOTSTRAP model as the dependent variable. This model is built based on a second bootstrap, with 5,000 iterations from which the coefficients for each of the variables are extracted, with a 95% confidence interval. This second bootstrap is necessary because, as previously pointed out, the efficiency results from the first stage might be correlated with the explanatory factors to emerge from the second stage, which might lead to inconsistent and biased estimations.

The results of the analysis are shown in Table 6.[7] As can be seen, three models have been proposed to which are added, in successive blocks, explanatory variables for interpretation. First, a basic model, Model I, is posited in which we introduce variables related to natural and cultural heritage, because it is felt that these might be one of the principal determining elements of efficiency or competitiveness in this area. Variables linked to the socio-economic situation are also added in this stage. In Model II, we include endowment variables linked to infrastructures and technological development in the analysis. Finally, in Model III, the effect of control variables related to geography and the effect of the time lapse are assessed. Based on the coefficients and the signs, the results can be considered robust between each of the models, because these remain stable during the various stages.[8]

We focus the interpretation of the results on the data shown in Model III, which considers all the external variables, and where we observe that in the case of factors related to cultural and natural resources, particularly worthy of note is the contrary sign shown by the two variables of goods declared by UNESCO to be world cultural heritage and natural heritage, respectively. Whereas the former exerts a positive effect, in other words, UNESCO declared cultural resources contribute towards greater efficiency in tourist management in the countries in this area, officially accredited natural heritage has the opposite effect. This result is reaffirmed with the coefficient, which is also negative, of the variable quantifying the percentage of protected natural areas in each country. Put differently, accumulating a greater number of both first- and second-order natural resources has

[7]Calculations were performed using STATA 15 software.

[8]As previously pointed out, a lack of homogeneous information meant that it was not possible to include other variables of interest, such as distance between tourist origin and destination, monetary indicators, and tourist capacity, when attempting to explain length of stay.

TABLE 6 Determinants of attracting international tourism

	Model I		Model II		Model III	
Variables	Results	95% Confidence interval	Results	95% Confidence interval	Results	95% Confidence Interval
Cultural heritage	0.0213** (0.0086)	[0.0065, 0.0408]	0.0283* (0.0058)	[0.0181, 0.0413]	0.0225* (0.0031)	[0.0166, 0.0291]
Natural heritage	−0.1306* (0.0429)	[−0.2252, −0.0601]	−0.1322* (0.0252)	[−0.1883, −0.0864]	−0.0773* (0.0134)	[−0.1050, −0.0508]
Protected areas	−0.0395* (0.0119)	[−0.0668, −0.0213]	−0.0459* (0.0073)	[−0.0619, −0.0329]	−0.0304* (0.0037)	[−0.0382, −0.0232]
Per capita GDP	−0.000* (0.000)	[−0.0001, 0.0000]	−0.0001* (0.0001)	[−0.0001, 0.0000]	−0.0001* (0.0000)	[−0.0002, 0.0001]
Safety	0.0105 (0.0037)	[0.0040, −0.0184]	0.0008 (0.0023)	[−0.0039, −0.0053]	0.0001 (0.0013)	[−0.0001, 0.0037]
Airline departures	—	—	0.0039* (0.0010)	[0.0024, 0.0064]	0.0024* (0.0003)	[0.0016, 0.0033]
Internet	—	—	−0.0021 (0.0028)	[−0.0078, 0.0032]	−0.0030 (0.0019)	[−0.0069, 0.0009]
Island_Dummy	—	—	—	—	0.3358* (0.0419)	[0.2520, 0.4190]
Trend	—	—	—	—	0.0117 (1.032)	[−0.0117, 0.0342]
Constant	1.0990* (0.2503)	[0.6908, −1.6550]	1.4197*(0.1819)	[1.1009, 1.8044]	1.0321* (0.1061)	[0.8339, 1.2521]
Sigma	0.2483* (0.0392)		0.1772* (0.0197)		0.1131* (0.0105)	
Wald-Chi-squared	16.19		59.11		262.82	

*Statistical significance at 1%;

**Statistical significance at 5%;

***Statistical significance at 10%. Number of bootstrap replications = 5,000.

a negative impact on the tourist efficiency of these countries, which gives an indication of the main kind of tourism in this area, which tends to be more concerned with including cultural aspects in pleasure trips. As regards socio-economic factors, the safety variable does not prove to be statistically significant in any of the three models. In other words, a greater level of insecurity has no significantly negative impact on the length of a tourist's stay. This finding might be interpreted as meaning that, because the output analysed is overnight stays, it could be felt that once the tourist has reached the country, the level of safety does not affect the duration of their stay, although it might prove to be a barrier in the initial choice of destination. The variable reflecting per capita GDP obtains a negative and statistically significant coefficient, which is the opposite finding to that reported in most studies that include this variable (Assaf & Josiassen, 2012; Das & Dirienzo, 2010). This reflects the particular features of tourism in this part of the world, which behaves quite contrary to other areas of the world, because in our case, the group of small countries in the Caribbean that achieve high levels of tourist efficiency correspond to areas with relatively lower GDP.

As regards infrastructure variables, we find that the percentage of Internet use, as a variable approximating technological development and communications, does not prove to be a significant variable, whereas the indicator of airline departures does, added to which it contributes positively to the efficiency obtained by countries. This confirms the clear relation between greater possibilities of access to tourist destinations, which might also impact on lower prices and enhanced efficiency in the destination. It also attaches importance to the presence of registered airline companies in each country as a driving factor. Finally, as regards the remaining variables, one is significant, the trend variable, which reflects the already mentioned slow progress being shown by these countries in terms of managing their resources. However, the island_dummy variable proves significant and also displays a positive coefficient, which is the highest of the variables analysed. This reflects the characteristics of tourism in these countries, which remains somewhat undiversified relative to UNWTO declarations. The tourism that comes to Latin-America and the Caribbean continues to display a motivation closely linked to the so-called resort accommodation and sun, sand, and sea tourism. As regards the previously analysed variables, countries that are islands, are in our sample destinations with a lower per capita GDP, which would explain this variable's negative coefficient. Moreover, it is a tourism that, even though it can consume other related products such as cultural heritage, as shown in our model, tends to have an impact that is highly concentrated around the infrastructure of the hotel in question, which usually boasts good facilities, which might explain the nonsignificance of the Internet variable.

6 | CONCLUSIONS

This study posits an efficiency analysis of tourist destinations in the Caribbean and Latin-America when managing their tourist resources (tourist arrivals and accommodation capacity), in order to maximize their competitiveness at a world scale, reflected in international tourists' length of stay. We also pinpoint a range of external factors that determine the level of efficiency achieved, contributing either negatively or positively to generating the right context so as to make the destination more efficient in a technical sense. The method used to conduct the analysis was a two-stage conditioned efficiency model, following Simar and Wilson (2007), where possible biases and serial correlations in the estimations are corrected by applying a double bootstrap, both during the first as well as the second stage.

As for the results, we have seen that the mean accumulated efficiency during the 5 year studied (2011-2015) exceeded 52.4%. The lack of any similar studies in the same context makes it impossible to relativize this figure although it can be said that the countries in our sample are performing at around 50% below their potential when it comes to optimizing overseas tourism output. With regard to the accumulated results per year, it can be seen that these countries are

progressing positively in terms of efficiency, albeit slowly. This gradual growth might be due to the fact that many of the countries analysed have only recently appeared as appealing destinations for international tourism. According to UNWTO (2015), new destinations have begun to emerge at an international scale, particularly in areas where there was no clear tradition or a well-developed tourist industry. This means they are only in the early stages of development and management, which is reflected by their slow although sure progress, despite the fact that the total number of tourist arrivals continues to grow year after year. In other words, these countries not only need to increase the number of tourists, as they have indeed been doing thus far but must also seek to manage them appropriately so as to lengthen their stays and, as a result, the impact they have. As reported by Botti et al. (2009), a longer stay is closely linked to visitor satisfaction and, therefore, ties in with competitiveness and efficiency. In this regard, it would be interesting to replicate the study in time so as to compare progress in the management of these relatively new tourist destinations.

In addition, and again taking into account the results from the first stage, a clear difference emerges between the accumulated efficiency ratios shown by countries in the Caribbean, which are above 70%, and countries in South America, for which the figure is around 25%. Nevertheless, these results that might be subject to slight changes were the flow of national or domestic tourism to be considered, as one possible explanation for the low efficiency ratios of certain Latin-American countries such as Chile, Argentina, and Uruguay. The reason is that part of the oversizing in physical resources (beds) might be due to internal demand, which we do not study. Another reason might also be proximity international tourism, in other words, tourists from neighbouring countries, and which might lead to considerably shorter stays. If we look at efficiency by countries, particularly noteworthy is the case of Mexico, the country displaying the greatest mean efficiency during the period analysed. Mexico evidences a solid and efficient international tourist sector, because it achieves a level close to the optimum in terms of maximizing its resource-based output. This is why the said country stands as the benchmark for measuring the relative efficiency of the other units. With a tourist sector that displays totally contrasting features but that nevertheless achieves a result equally close to the optimum is Belize, a country whose tourist industry is on a much smaller scale, yet which attains output levels close to the efficiency frontier relative to its resources. This enables us to demonstrate that our model, which considers a hypothesis of VRS, is taking into account the different sizes of the countries and does not disadvantage countries that have only a small tourist sector in relative terms.

In the second stage of the analysis, we identify different external variables that determine the efficiency of the destinations examined and that might explain suboptimal behaviour. The principal indicators that contribute to improving efficiency in international tourist management are UNESCO cultural heritage declarations and larger airline facilities. We also find an island effect that has a particularly significant and positive impact on the efficiency of destinations in this area. The positive and significant coefficient of this variable confirms the fact that the tourist industry in countries in the Caribbean and South America has yet to reach full diversification. The principal motivation drawing tourists to these destinations still seems to revolve mainly around the traditional resort tourism of sun, sand, and sea and as a honeymoon destination, centred around the beaches of the Caribbean and whose impact is confined to an area limited to the actual infrastructure itself.

This work also opens up a number of avenues for future lines of research that might overcome some of the limitations inherent in the present work and that are particularly shaped by the lack of available information. First, it would prove interesting to expand the sample of tourist destinations by including other countries that display enormous tourist potential such as Brazil, Costa Rica, Paraguay, or Venezuela. In addition, the variables that make up the study could also be increased by incorporating monetary indicators such as revenue from tourism or the exchange rate with the U.S. dollar, or production indicators (number of firms and size of the tourist industry), but which do not systematically and homogeneously appear in available databases. It would also be interesting to consider the importance of domestic tourist flows, which might be determinant in the overcapacity observed in certain countries in South America, but whose compatibility when establishing a single standardized database for the whole sample proves impossible for the moment.

Finally, with regard to the usefulness of studies such as this, it should be pointed out that the conclusions to emerge aim to prove relevant at the level of tourist policy management. The discussion to arise here might spawn a whole range of useful tools for the decision-making process in the sector and might help tourist destinations to gain a more competitive position in the international arena. It also provides a clear picture of the performance of these countries that helps gauge the extent to which they are achieving their principal objectives.

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CAPÍTULO 5.

Ranking world tourist destinations with a composite indicator of competitiveness: To weigh or not to weigh?

Ranking world tourist destinations with a composite indicator of competitiveness: *To weigh or not to weigh*?

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Abstract: This paper contributes a weighted composite indicator of competitiveness for 136 world tourist destinations. To that end, *Data Envelopment Analysis* and *Multi-Criteria-Decision-Making* techniques are used with raw indicators from the 2017 edition of the *Travel & Tourism Competitiveness Report* of the World Economic Forum (WEF). An outstanding feature of our approach is that weights are endogenously generated. Furthermore, the role played by several variables in tourism competitiveness is assessed using truncated regression and bootstrapping. The ranking of world tourist destinations produced by our weighted composite indicator of competitiveness is, however, fairly similar to that derived from the unweighted indicator provided by the WEF. Furthermore, we also find that several economic, geographical, cultural and political features are significant determinants of the competitiveness of tourist destinations

Keywords: Competitiveness; composite indicators; *Data Envelopment Analysis*; *Multi-Criteria-Decision-Making*; tourist destinations; weightings

JEL Classification: C61; L83; Z30

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1. Introduction: motivation and literature context

At a global level, tourism is currently one of the fastest growing economic activities, to the point where it has become as important in some countries as the sectors that have traditionally been key to economic progress (Mendola and Volo, 2017). This boom has been coupled with the ever-greater diversification of tourism, reflected in the emergence of new destinations that compete with traditional ones (Lee, 2015). Furthermore, according to available forecasts, this growth in tourism is set to continue in the coming years, thus helping to consolidate a sector with strong economic dynamism, which drives job creation and investment in infrastructure (UNWTO, 2016). Similarly, tourism activity is playing an increasingly relevant role in the economic and social progress of many developing countries (Joshi et al. 2017). A direct consequence of the expansion of tourism is the growing body of research and scientific studies on the performance of the sector (Sainaghi et al. 2017). Some notable examples are those that seek to measure the competitiveness of tourist destinations. The value of this type of analysis essentially lies in the fact that it shows managers of tourist destinations how they compare to competitors, and enables them to set objectives and anticipate trends (Mendola and Volo, 2017), with the ultimate aim of gaining a competitive advantage (Croes and Kubickova, 2013) and improving their ability to manage visitor flows.

Most studies point out that the competitiveness of a tourist destination is a complex concept that has a strongly multi-dimensional nature (Crouch, 2011; Dwyer et al. 2014). It should thus be explored from multiple perspectives; as Croes and Kubickova (2013: 148) state '… *a universal and precise definition* [of competitiveness] *does not exist*'. Nevertheless, a widely-accepted definition within the scientific community is the one proposed by Ritchie and Crouch (2003), who define the competitiveness of a tourist destination as '… [the] *ability to increase tourism expenditure, to increasingly attract visitors while providing them with satisfying, memorable experiences, and to do so in a profitable way, while enhancing the well-being of destination residents and preserving the natural capital of the destination for future generations*'. In addition, competitiveness is usually understood in relative terms and is related to the position that a certain destination holds within the world tourism market (Pulido-Fernández and Rodríguez-Díaz, 2016).

Many studies in this field have tried to quantify the competitiveness of international tourist destinations using information from surveys administered directly to tourists (Cracolici and Nijkamp, 2008; Chen et al. 2008; Bahar and Kozak, 2007) and to other stakeholders (Dwyer et al. 2012; Bornhorst et al. 2010), or data sourced from official statistics (Pulido-Fernández and Rodríguez-Díaz, 2016; Zhang et al., 2011; Croes 2011; Das and Direnzo, 2010). Regardless of the origin of the information, most studies use a range of statistical techniques to produce composite indicators of competitiveness, constructed on the basis of multiple variables aimed at capturing the different dimensions of the concept (see Mendola and Volo, 2017; Sainaghi et al. 2017). The ultimate aim of these analyses is to rank tourist destinations according to their competitiveness.

The most noteworthy contribution in this area is perhaps the *Travel & Tourism Competitiveness Index* (T&TCI), a composite indicator of the competitiveness of the main tourist destinations in the world, which is regularly produced and published by the World Economic Forum (WEF) in *The Travel & Tourism Competitiveness Report*. The aim of this indicator —which for practical reasons we will refer to hereafter as the T&TCI-WEF— is to evaluate the factors and policies that make a destination attractive for international tourism. To that end, the 2017 edition of *The Travel & Tourism Competitiveness Report* (WEF, 2017) includes a total of 136 tourist destinations and 90 raw indicators, which capture different dimensions of competitiveness, including political, socioeconomic, structural, environmental and cultural factors, among others. These indicators are grouped into 14 pillars, which in turn make up 4 sub-indexes: enabling environment; travel and tourism policy and enabling conditions; infrastructure; and natural and cultural resources. Finally, these sub-indexes are aggregated into the global T&TCI-WEF. From a methodological standpoint, at each level of aggregation, the WEF builds the corresponding composite indicator as an unweighted average of the indicators, pillars or sub-indexes included in the level that immediately precedes it. Further details can be found in WEF (2017).

Although it has been recognised as a useful tool for managing tourist destinations, the T&TCI-WEF has attracted a fair amount of criticism, which has been summarised in the paper by Croes and Kubickova (2013). First, criticism has been levelled at the fact that differences between countries in terms of size and level of development are not accounted for in the construction of the index. Likewise, the criterion for selecting raw indicators has been questioned, as well as the problems that could arise as a result of combining quantitative and qualitative variables in a single composite indicator. In addition to these criticisms, there is also the *arbitrariness* in determining the weights used in the different aggregation processes involved in the calculation of the T&TCI-WEF (see Pulido-Fernández and Rodríguez-Díaz, 2016). In this regard, the use of simple (unweighted) means may not be appropriate since the raw indicators are not expected to all have the same effect on competitiveness. Moreover, the pillars used by the WEF are made up of different numbers of indicators, ranging from 3 to 12. In practice, this means that some indicators contribute more to the aggregate indicator than others do.

Regarding this last limitation, a number of researchers have proposed alternative approaches to aggregating the WEF data. Mazanec and Ring (2011) use the *Partial Least Squares-Path Modelling* method to construct a weighting scheme for the pillars based on their explanatory power for the T&TCI-WEF. Lan et al. (2012) employ *Neural Network Analysis* to obtain an *objective* weighting system for the pillars. Croes and Kubickova (2013) determine weights for the pillars based on their correlation with the T&TCI-WEF. One of the most recent contributions, however, is that of Pérez-Moreno et al. (2016), who use a multi-criteria model as an alternative approach to the problem of aggregation and also propose a solution to the issue of substitutability between pillars. To that end, the authors establish two statistical values of reference —the so-called *aspiration* and *reservation* values— and standardise the values of the

pillars between these two levels. They then use arithmetic means to construct three composite indicators with different degrees of compensation between pillars. Along similar lines, Pulido-Fernández and Rodríguez-Díaz (2016) also use multi-criteria models based on a double reference point, although in this case the proposed method does not allow for compensation between pillars.

Against this background, in this paper we employ the information compiled in the 2017 edition of *The Travel & Tourism Competitiveness Report* (WEF, 2017) to provide a weighted composite indicator of competitiveness for world tourist destinations. Following Guardiola and Picazo-Tadeo (2014), this indicator is computed using *Data Envelopment Analysis* (DEA) (Charnes et al. 1978) and *Multi-Criteria Decision Making* (MCDM) techniques (Despotis, 2002; 2005). The main advantage of this approach is that the weights assigned to the indicators, pillars and sub-indexes in the construction of the different aggregates are obtained endogenously. Based on the *Benefit-of-the-Doubt* (BoD) principle (Cherchye et al. 2007), DEA techniques can be used to calculate the set of weights that would rate each tourist destination in the most favourable position compared to all other destinations rated according to the same weighting scheme. MCDM analysis can then be used to rank tourist destinations according their competitiveness. Unlike most previous studies in this line of research, which take pillars as a starting point, we work from raw indicators thus enabling a direct comparison between our competitiveness rankings and those provided by the WEF. Finally, we use truncated regression and bootstrapping techniques to examine the factors that determine the competitiveness of tourist destinations, as calculated by our composite indicator.

Beyond the abovementioned features of our composite indicator, the foremost contribution of our research is eminently practical. In this respect, whereas several authors have combined DEA and MCDM to build composite indicators of concepts such as sustainability (Reig-Martínez et al., 2011), well-being (Bernini et al., 2013; Peiró-Palomino and Picazo-Tadeo, 2018) or life satisfaction (Guardiola and Picazo-Tadeo, 2014), our paper is, as far as we are aware, the first one that uses this joint analysis to create an indicator of tourism competitiveness. Furthermore, we reasonably believe that our results might be of interest for policymakers, managers of tourist industries and other stakeholders for at least two reasons. On the one hand, they provide noteworthy information that can help to identify strengths and weaknesses of tourist destinations and pinpoint those factors that represent the greatest constraint to their competitiveness. On the other, our approach enables the identification of the pillars and sub-indexes that contribute the most to the competitiveness of tourist destinations. Taken together, these two features could provide policymakers and managers with relevant information that can help them to prioritise reforms regarding their tourist industries.

Following this Introduction, Section 2 describes the methodology and the data; Section 3 comments on the results; and finally, Section 4 concludes and suggests some lines for further research.

2. Methodology, data, variables and sources

2.1. Methodology: Assessing competitiveness with DEA and MCDM

To weight or not to weight? And, if so, *how to weight?* These are a couple of relevant questions that researchers should answer before attempting to build a composite indicator.[4] Although it has been common practice in the literature to compute unweighted indicators, i.e., with equal weightings, some papers have used exogenous weighting schemes based on expert opinions or other *ad hoc* criteria, including the *Analytic Hierarchy Process* (AHP) (Saaty, 1980) or *Delphi* methodologies (see Linstone et al. 2002). Conversely, a notable feature of DEA is that weightings are endogenously generated using the BoD principle. DEA is a non-parametric technique grounded in mathematical programming that was proposed in the 1970s as an approach to assessing production performance (Charnes et al. 1978). Basically, it yields a performance indicator for production units in a sample by comparing their inputs and outputs with best-observed practices (see Cooper et al. 2007 for further details).

Lovell et al. (1995) later adapted DEA techniques to calculate composite indicators involving a range of different economic, environmental and/or social issues (see Zhou et al. 2007). In essence, the transformation of the original formulation of DEA models into the mathematical programs needed to construct a composite indicator requires assuming the existence of an input equal to one that works as a *helmsman*, and considering all the dimensions included in the definition of the composite indicator as outputs (see Lovell et al. 1995: 509). In our case study, assuming that we observe v = 1,...,V variables representing different competitiveness dimensions of d = 1,…,D tourist destinations, the simplest formulation that enables the computation of a composite indicator for the competitiveness of destination d′ ($CI_{d'}$) is:

$$
\begin{aligned}
&CI_{d'} = \text{Maximise}_{\,w_{vd'}} \sum_{v=1}^{V} w_{vd'}\, Variable_{vd'} \\
&\text{Subject to:} \\
&\quad \sum_{v=1}^{V} w_{vd'}\, Variable_{vd} \leq 1 \qquad\qquad d = 1,\ldots,D \\
&\quad w_{vd'} \geq 0 \qquad\qquad v = 1,\ldots,V \qquad\qquad (1)
\end{aligned}
$$

where $Variable_{vd}$ is the observed value of variable v (dimension of competitiveness) in destination d; and w_{vd} is the weight assigned to variable v in the composite indicator of tourist destination d. Furthermore, the indicators of competitiveness obtained from (1) are normalised to one, so that the larger the score, the higher the competitiveness.

As stated above, the main feature of our research on assessing competitiveness with DEA-based models is that the weights assigned to the dimensions of competitiveness when computing the composite indicator are endogenously determined at the tourist destination level. Moreover, in line with the abovementioned BoD principle, these weightings —which by

[4] In a recent paper, Becker et al. (2017) discuss the importance of weights in building composite indicators, with empirical illustrations of environmental issues. Also, see the discussion by Hsieh (2004) in the context of composite indicators for quality of life measurement.

construction are *idiosyncratic*— are calculated so as to maximise the competitiveness of each tourist destination when it is compared with all other destinations assessed according to the same weighting scheme (Cherchye et al. 2007). Hence, dimensions in which a destination performs poorly will be assigned a lower weight, while those in which it performs well will receive a higher weight. While DEA can be seen as a successful tool for computing a composite indicator of competitiveness, it might not be so effective, however, when it comes to ranking tourist destinations. There are several reasons for this, but two issues are particularly relevant to our case study.

On the one hand, when there is a large number of competitiveness dimensions relative to the number of tourist destinations, DEA-based model might suffer from a lack of discriminating power, thus preventing all destinations in the sample from being fully ranked against each other (see Dyson et al. 2001 for technical details). On the other hand, competitiveness is evaluated by comparing each tourist destination with a different set of peers and using different weighting schemes for competitiveness dimensions, which might render any direct comparison meaningless (see Kao and Hung, 2005).

In order to overcome the two abovementioned shortcomings of DEA when it comes to ranking tourist destinations, in line with recent papers —some of which have been mentioned in the Introduction—, we follow the proposal by Despotis (2002; 2005).[5] In essence, this approach consists of using MCDM techniques to compute a common set of weights across tourist destinations for all competitiveness dimensions, in such a way as to minimise the distance between the resulting MCDM composite indicator of competitiveness and that computed with an individual set of weights and DEA. Furthermore, this approach allows all tourist destinations in the sample to be fully ranked.

Following this methodological approach, adapting the *global-efficiency* indicator proposed in Despotis (2002) —which was, in turn, grounded in previous work by Li and Reeves (1999)— in order to compute a *global* composite indicator of tourist destination competitiveness, yields the following linear mathematical program (see Despotis, 2005):

$$
\begin{aligned}
&\text{Minimise}_{\ m_d,\, w_v,\, h} \quad t\frac{1}{D}\sum_{d=1}^{D} m_d + (1-t)\, h \\
&\text{Subject to:} \\
&\quad \sum_{v=1}^{V} w_v\, \text{Variable}_{vd} + m_d = CI^{\,*}_{\,d} \qquad d = 1,\ldots,D \\
&\quad (m_d - h) \le 0 \qquad\qquad d = 1,\ldots,D \\
&\quad m_d \ge 0 \qquad\qquad d = 1,\ldots,D \\
&\quad w_v \ge \varepsilon \qquad\qquad v = 1,\ldots,V \\
&\quad h \ge 0 \qquad\qquad (2)
\end{aligned}
$$

[5] Given the fundamentally applied nature of our research, it is not our intention here to review all the solutions proposed by the specialised literature to address these widely-recognised drawbacks of DEA for the construction of composite indicators; for a summary, see Reig-Martínez et al. (2011: 564-566).

where CI^*_d stands for the composite competitiveness indicator calculated with DEA; w_v represents the common weight assigned to the variable v; ε is a non-*Archimedean* small number which ensures that all the dimensions of competitiveness have a positive weight in the calculation of the composite indicator; h is a non-negative parameter to be estimated; m_d represents the deviation between the composite competitiveness indicator for destination d calculated with DEA and individual weights, and the indicator calculated with MCDM and common weights; and finally, t is a parameter ranging from 0 to 1 that should be set in advance by the researcher and that allows for alternative theoretical assessments.

While different values for the parameter t yield different sets of common weights, in our case study we have set a value of 1. In this scenario —which corresponds to the concept of *Manhattan* or *city-block* distance—, the objective function to minimise in program (2) is the mean deviation between the composite competitiveness indicators for tourist destinations calculated with DEA and with MCDM.[6] Using the terminology proposed by Bernini et al. (2013), we refer to this scenario as the *collective optimum* in that, for all the tourist destinations, the average distance between their competitiveness indicator computed with the best possible weights and that calculated with common weights is minimised.

Finally, let us point out that more comprehensive models can also be used in place of expression (1) to compute DEA-based scores of the competitiveness of tourist destinations with idiosyncratic weights. For example, Reig-Martínez et al. (2011) suggested using the additive output-oriented *Slacks Based Measure* (SBM) of performance proposed by Tone (2001). One of the chief advantages of this approach to assessing performance is that it accounts for both radial and non-radial (i.e., *slacks*) potential improvements, thus offering a more complete picture of performance. Formally, this SBM measure of competitiveness for tourist destination d', which also seeks the most favourable weighting scheme for each destination, comes from the solution to the following program (see technical details in Cooper et al. 2007):

$$CI_{d'} = \text{Minimise}_{\lambda_d,\, S_v^+} \quad \frac{1}{1 + \frac{1}{V}\left(\sum_{v=1}^{V} S_v^+ / \text{Variable}_{vd'}\right)}$$

Subject to:

$$x_{d'} \geq \sum_{d=1}^{D} \lambda_d x_d$$

$$\text{Variable}_{vd'} = \sum_{d=1}^{D} \lambda_d \text{Variable}_{vd} - S_v^+ \qquad v = 1,\ldots,V$$

$$S_v^+ \geq 0 \qquad v = 1,\ldots,V$$

$$\lambda_d \geq 0 \qquad d = 1,\ldots,D \qquad (3)$$

with x representing the abovementioned *helmsman* input vector; S_v^+ the *slack* in the variable v; and λ_d the intensity with which tourist destination d enters the composition of the reference

[6] Bernini et al. (2013: 413) provide a detailed description of the different theoretical assumptions that can be made for the parameter t, and their implications regarding the objective function to be minimised with program (2).

set to which destination d' is being compared. Furthermore, the *idiosyncratic* weights can be directly obtained from the dual formulation of this program (see technical details in Tone, 2001: 503).

2.2. Data, variables and sources

As mentioned in the Introduction, our composite indicator of the competitiveness of international tourist destinations has been built using the information provided by the WEF in the 2017 edition of its *Travel & Tourism Competitiveness Report* (WEF, 2017). The data on the indicators included in this report mostly correspond to years 2015 and 2016, although in a few cases, e.g., for variables that remain relatively stable over time such as hospital beds or baseline water stress, the data are from 2014 or even prior years. In particular, our dataset includes 87 raw indicators covering the main dimensions of competitiveness in 136 tourist destinations.[7] Furthermore, these indicators have all been normalised to a scale of 1 to 7. Accordingly, in the case of indicators for which larger values correspond to higher competitiveness —e.g., the number of world heritage natural or cultural sites— the *min-max* formula has been applied:

$$6\left(\frac{v_d - \min(v)}{\max(v) - \min(v)}\right) + 1 \qquad (4)$$

where v_d stands for the observed value of variable (competitiveness indicator) v in tourist destination d.

Conversely, indicators for which larger values are associated with lower competitiveness —e.g., terrorism incidence— have been inversely normalised using the formula:

$$6\left(\frac{\max(v) - v_d}{\max(v) - \min(v)}\right) + 1 \qquad (5)$$

[7] In its 2017 report, the WEF actually provided full information on 88 indicators (data for *road density* and *paved road density* —both included in the ground and port infrastructure pillar— are not offered); additionally, *malaria incidence* —included in the pillar health and hygiene— has been excluded from our analysis due to the difficulties in distinguishing between a zero value and other alternatives such as *malaria free* or *disappeared without specific measures*. The report includes a detailed description of all these indicators and the values that they take in the tourist destinations included in our research. Furthermore, some indicators are missing data on certain countries. In these cases, which represent only 1.8% of the total, we have taken the average value for that indicator from the countries ranked immediately above and immediately below the country in question in the relevant pillar. While the use of this approach to estimate missing data has allowed us to include in our research all countries featured in the 2017 edition of the WEF *Travel & Tourism Competitiveness Report*, it is our belief that it does not seriously bias our results regarding competitiveness.

Table 1. Pillars and sub-indexes in the T&TCI of the WEF

Sub-index A. Enabling environment
Pillar 1. Business environment
Pillar 2. Safety and security
Pillar 3. Health and hygiene
Pillar 4. Human resources and labour market
Pillar 5. Information and communication technologies readiness
Sub-index B. Travel & tourism policy and enabling conditions
Pillar 6. Prioritisation of travel & tourism
Pillar 7. International openness
Pillar 8. Price competitiveness
Pillar 9. Environmental sustainability
Sub-index C. Infrastructure
Pillar 10. Air transport infrastructure
Pillar 11. Ground and port infrastructure
Pillar 12. Tourist services infrastructure
Sub-index D. Natural and cultural resources
Pillar 13. Natural resources
Pillar 14. Cultural resources and business travel

Source: WEF (2017)

Following the methodology explained in Section 2.1, we have used these normalised raw indicators to calculate a composite indicator of tourism competitiveness at the destination level for each one of the 14 pillars considered by the WEF and described in Table 1. These pillars' indicators have then been employed as inputs to compute four additional composite indicators of competitiveness at the sub-index level, i.e., enabling environment; travel and tourism policy and enabling conditions; infrastructure; and natural and cultural resources. Lastly, the indicators calculated at the sub-index level have been used as inputs in the computation of our global competitiveness composite indicator, i.e., the T&TCI-DEA.[8] In all cases, DEA-based *idiosyncratic* weights at the tourist destination level have been obtained from the SBM model of expression (3), with the assumption of constant returns to scale (Charnes et al., 1978); moreover, a constraint on the optimal weightings for indicators, pillars and sub-indexes from the MCDM approach ensures that they are always strictly positive; i.e., larger than 0.001.

On another note, the variables used in the second-stage analysis to explain the differences in competitiveness among tourist destinations were selected on the basis of several previous studies focused on the T&TCI-WEF. Appendix 1 presents the definition, statistical source and main descriptive statistics of these variables.

First, we include a variable that quantifies the relative importance of the tourist industry in each destination, measured as a share of GDP; according to Lee (2015), this share should have

[8] All computations have been carried out with DEA-Solver Pro7.0 and Solver software.

a positive effect on competitiveness, although other authors such as Ivanov and Webster (2013) find no significant impact. In addition, the analysis includes four variables relating to socio-economic and political factors. The first two are the *Human Development Index* (HDI) produced by the United Nations and a G*lobalisation Index*, both of which should boost the competitiveness of tourist destinations (e.g., see Ivanov and Webster, 2013). A *Control of corruption Index* is also included as explanatory variable, which should positively affect competitiveness —according to Das and Direnzo (2010), corruption weakens the competitiveness of tourist destinations—, together with a variable that measures the *Quality of democracy*, which is also expected to have a positive effect on competitiveness (Lee, 2015). Finally, a number of other variables are included to capture geographical characteristics; namely, a dummy variable that identifies coastal tourist destinations, and a series of dummies that identify the continent where the tourist destination is located.

3. Results and discussion

In this Section we present and discuss the results obtained with our weighted composite indicator of tourist destination competitiveness. However, before commenting on these results, let us briefly address the issue of weighting. In this respect, the weights assigned to pillars and sub-indexes in the calculation of the composite indicators of competitiveness at the sub-index and global levels, respectively, are presented in Table 2.[9] It is worth noting that the optimal weights for pillars are in all cases noticeably greater than zero. Furthermore, it is sub-index D —natural and cultural resources— that makes the largest contribution to the global T&TCI-DEA indicator. This supports the idea that tourist destinations endowed with plenty of natural and cultural resources enjoy a marked competitive advantage (Hadad et al. 2012; Cuccia et al. 2016; Oukil et al. 2016; Herrero and Gómez, 2017). Likewise, the contribution of infrastructure to global competitiveness —sub-index C— is also important. Conversely, the smallest contribution is made by sub-index A —enabling environment—, which encompasses indicators related to issues such as the business environment, safety and security, and health and hygiene, among others.

Table 2. Optimal weights for pillars and sub-indexes

	Sub-index A	Sub-index B	Sub-index C	Sub-index D	T&TCI-DEA
Sub-index A					0.1245
Pillar 1	0.2592	-	-	-	
Pillar 2	0.1728	-	-	-	
Pillar 3	0.2741	-	-	-	
Pillar 4	0.0602	-	-	-	
Pillar 5	0.4630	-	-	-	

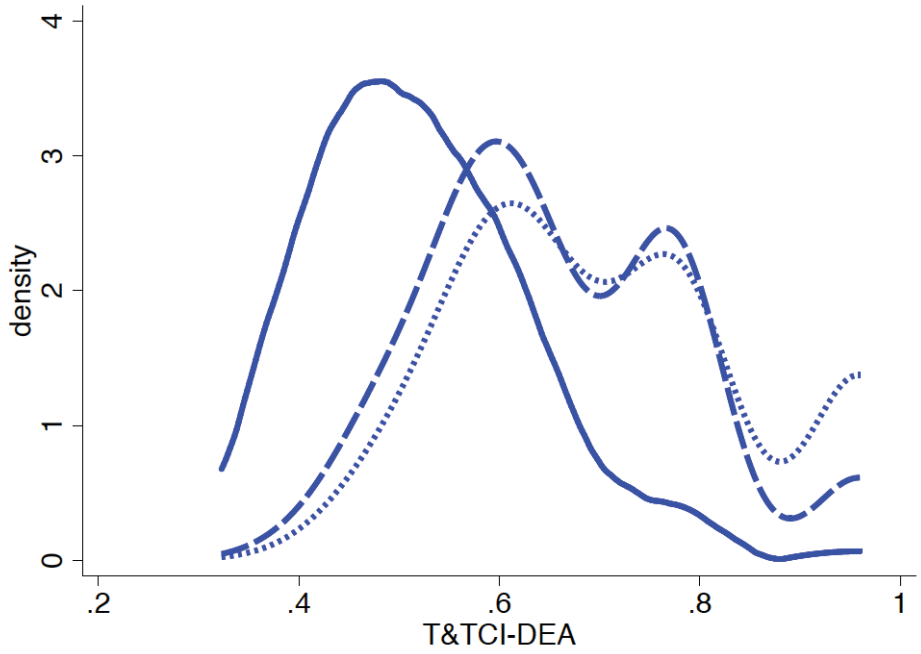
[9] For the sake of saving space, the optimal weights assigned to raw indicators in building the composite indicators of competitiveness at the pillar level are not included in the paper, but they are available to readers on request.

Sub-index B					0.2116
Pillar 6	-	0.5036	-	-	
Pillar 7	-	0.4106	-	-	
Pillar 8	-	0.3263	-	-	
Pillar 9	-	0.1862	-	-	
Sub-index C					0.3137
Pillar 10	-	-	0.6506	-	
Pillar 11	-	-	0.2617	-	
Pillar 12	-	-	0.3397	-	
Sub-index D					0.4295
Pillar 13	-	-	-	0.3419	
Pillar 14	-	-	-	0.7992	

Kernel densities depicted in Figure 1 offer a picture of the distribution of competitiveness.[10] The main mode of the distribution of the T&TCI-DEA —represented by the solid line— is slightly above 0.4, with moderate dispersion; furthermore, the distribution exhibits a long right tail with a barely perceptible concentration around 0.8. There are, however, clear differences between tourist destinations in terms of both tourist arrivals and inbound receipts; e.g., according to the data in the 2017 edition of the *Travel & Tourism Competitiveness Report*, more than 77.5 million tourists visited the United States, whereas only 155,000 visited Bhutan. With such disparities, it is certainly difficult to determine from the unweighted kernel density how many tourists/receipts actually share tourist destinations with low/high competitiveness. Therefore, we have computed tourist-weighted and receipt-weighted kernel densities, depicted in Figure 1 by dashed and dotted lines, respectively. Both distributions are noticeably to the right of the unweighted distribution, suggesting that the most competitive destinations are also those that receive more tourists and enjoy a larger share of inbound receipts. Likewise, weighted densities present two well-defined modes around the scores of 0.6 and 0.75, as well as greater dispersion. Finally, a relative concentration of tourists and receipts is also observed at the right of both distributions, which is largely driven by the importance of the United States as a leading destination for international tourists. Additionally, from a T&TCI-DEA value of about 0.8, the density of inbound receipts clearly surpasses that of tourists, indicating that the most competitive destinations generate greater added value per visitor.

[10] Kernel densities are well-known exploratory data-analysis tools (for a discussion, see Henderson and Parmeter, 2015). We have used the *Gaussian* kernel function for computational ease; computations have been carried out with Stata 15 software.

Figure 1. Kernel density functions of T&TCI-DEA scores: unweighted (solid line), tourist-weighted (dashed line) and receipts-weighted (dotted line).



Regarding competitiveness at the country level, Table 3 displays averages, standard deviations, and the five most/least competitive tourist destinations according to our global T&TCI-DEA indicator, as well as the four composite indicators computed at the sub-index level. Full rankings are in Appendix 2, which, for the purpose of comparison, also includes the ranking from the T&TCI-WEF indicator.[11] The highest average score of competitiveness, i.e., 0.707, corresponds to sub-index B —travel and tourism policy and enabling conditions. At the opposite extreme, the lowest average competitiveness is found for sub-index D —natural and cultural resources. This might be due to the concentration of heritage resources, particularly those recognised by UNESCO, in relatively few countries, including China, Spain and France, among others.

Table 3. Results for competitiveness from the T&TCI-DEA (*1 best; 0 worst*)

	Average score	Standard deviation	Top five tourist destinations (score)	Bottom five tourist destinations (score)
Sub-index A. Enabling environment	0.647	0.163	Switzerland (0.974) Hong Kong (0.943) Finland (0.939) Japan (0.934) Norway (0.925)	Chad (0.303) Yemen (0.348) Congo DR (0.381) Burundi (0.383) Mauritania (0.390)

[11] The rankings at the pillar level from our DEA-MCDM composite indicators are not included in the paper, but they are provided online as supplementary material.

Sub-index B. Travel & tourism policy and enabling conditions	0.707	0.109	Singapore (0.939) Dominican Rep. (0.899) Portugal (0.884) Malta (0.878) Mauritius (0.875)	Congo DR (0.424) Yemen (0.428) Burundi (0.463) Cameroon (0.485) Algeria (0.497)
Sub-index C. Infrastructure	0.447	0.128	United States (0.988) Iceland (0.733) Germany (0.704) United Kingdom (0.688) Canada (0.673)	Burundi (0.254) Congo DR (0.254) Sierra Leone (0.257) Lesotho (0.259) Chad (0.259)
Sub-index D. Natural and cultural resources	0.347	0.116	United States (0.898) China (0.890) Spain (0.686) France (0.664) Italy (0.656)	Kuwait (0.228) Moldova (0.229) Bahrain (0.232) Burundi (0.237) Yemen (0.241)
T&TCI-DEA	0.519	0.109	United States (0.959) China (0.799) Spain (0.786) France (0.774) Germany (0.772)	Yemen (0.323) Burundi (0.327) Chad (0.335) Congo DR (0.341) Sierra Leone (0.352)

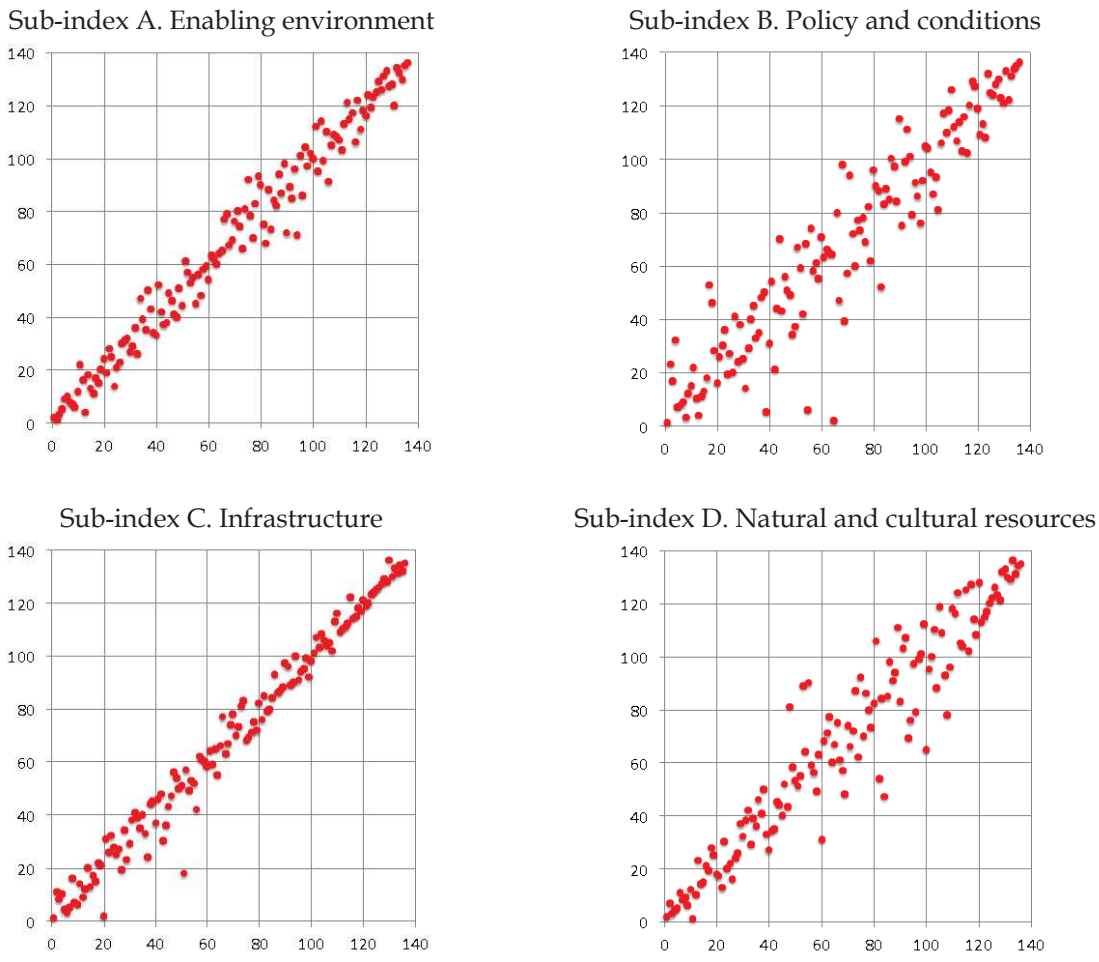
According to our global T&TCI-DEA, the United States is the most competitive tourist destination worldwide, followed by China and three European destinations, namely, Spain, France and Germany. These are all mature international tourist destinations that, in general, enjoy good safety levels, health services, human resources, and technological readiness, among other factors. Furthermore, they stand out for their endowments of infrastructure and natural and cultural resources, which are the two features that, according to our results, contribute the most to global competitiveness. In this regard, while the three European destinations and China stand out in terms of UNESCO-designated heritage sites as mentioned above, the United States is notable for its sports infrastructure.

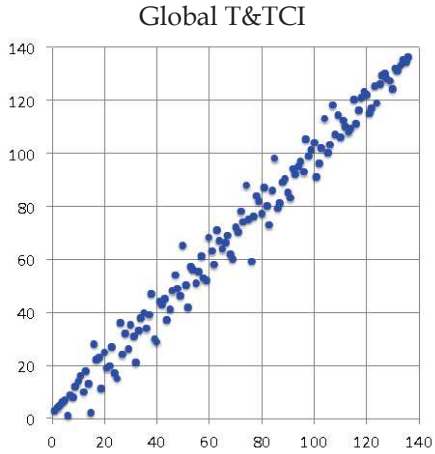
The five least competitive world tourism destinations according to our indicator are, in this order, Yemen, Burundi, Chad, Congo DR and Sierra Leone. Most of these countries are in Africa, are generally fairly underdeveloped, their tourism industries represent a small share of their production structure, and they have limited cultural and natural heritage. In addition, it is very significant to observe the remarkably and consistently low levels of competitiveness of these tourist destinations in the four sub-indexes considered. Therefore, the lack of tourism competitiveness of the African countries that occupy most of the bottom positions in our ranking is not the isolated result of specific weaknesses, but rather the consequence of pervasive deficits in almost every pillar of competitiveness: mostly, poor enabling environments —mainly regarding business environments, safety and security or human

resources; weak tourism policies and enabling conditions; insufficient infrastructure; as well as a scarcity of cultural resources.

Let us now comment on the relationship between our T&TCI-DEA scores of the competitiveness of international tourist destinations computed with endogenous weights, and those from the unweighted T&TIC-WEF indicator directly reported by the WEF. Figure 2 plots the rankings of competitiveness from both composite indicators at the sub-index and global levels. At first glancing, the two rankings of tourist destinations are fairly similar, particularly in the case of sub-indexes A —enabling environment— and C —infrastructure— as well as the global T&TCI. *Spearman*'s correlations reported in Table 4, which are all high and significant at the one-percent level, provide further statistical support for this relationship. In addition, results from a *Kolmogorov-Smirnov* test (see Conover, 1999) fail in all cases to reject, also at standard confidence levels, the null hypothesis of equality of distributions between the scores of competitiveness from the T&TCI-DEA and T&TCI-WEF indicators. In summary, the rankings of world tourist destinations from the two composite indicators of competitiveness are very similar.

Figure 2. Rankings of competitiveness from the T&TCI-WEF (horizontal axis) and the T&TCI-DEA (vertical axis)





Furthermore, as can be seen in Appendix 2, of the five most competitive tourist destinations according to our indicator —the United States, China, Spain, France and Germany— the three European destinations hold the top three spots in the WEF classification, while the United States is in sixth position. The biggest discrepancy occurs in the case of China, which drops to fifteenth place in the WEF ranking. However, the two rankings are virtually identical when it comes to the bottom five tourist destinations.

Table 4. Spearman-rank correlations between T&TCI-DEA and T&TCI-WEF scores

	Spearman *rho*-correlation	*p*-value
Sub-index A. Enabling environment	0.9864***	0.0000
Sub-index B. Travel & tourism policy and enabling conditions	0.9377***	0.0000
Sub-index C. Infrastructure	0.9892***	0.0000
Sub-index D. Natural and cultural resources	0.9576***	0.0000
Global T&TCI	0.9902***	0.0000

*** *stands for statistical significance at 1% confidence level.*

3.1. Second-stage analysis: Explaining the T&TCI-DEA indicator

Aside from assessing the competitiveness of tourist destinations, empirical literature in this field of research has also focused on exploring its determinants. Without aiming to be exhaustive, some of these papers, which have mostly used regression analysis to explain the T&TCI-WEF, include: Das and Direnzo (2010), the main aim of which is to assess the impact of political corruption on competitiveness; Ivanov and Webster (2013), which includes globalisation as an important determinant of competitiveness; and Lee (2015), which, in addition to other features, includes government quality as an explanatory variable for competitiveness.

In a similar vein, in this paper we adopt the approach suggested by Simar and Wilson (2007)

—based on truncated regression and bootstrapping— to explain differences in the competitiveness of tourist destinations according to our composite indicator. This approach allows us to account for the nature of our DEA-based scores of competitiveness and the unknown serial correlation between them. Essentially, it requires simulating a sensible data-generating process from which to create artificial bootstrap samples, and then constructing standard errors and confidence intervals for the parameters of interest through bootstrapping. Following the first algorithm in Simar and Wilson (2007: 41-42), explaining our T&TCI-DEA entails the following four steps:

1. Compute a set of competitiveness scores for the 136 tourist destinations in the sample using the DEA-model in expression (3) and MCDM, as explained in Section 2.1.

2. Use maximum likelihood to estimate the parameters β and σ_ε in the truncated regression of the competitiveness scores obtained in step 1 on a set of covariates z, using the subset of tourist destinations with scores below one ($\widehat{\text{T}}\text{\&TCI-DEA}_d < 1$). Formally:

   $$\widehat{\text{T}}\text{\&TCI-DEA}_d = \beta z'_d + \epsilon_d \text{ , with } \epsilon_d \equiv \varepsilon_d + \zeta_d \text{ and } \zeta_d \equiv \widehat{\text{T}}\text{\&TCI-DEA}_d - \text{T\&TCI-DEA}_d$$

3. Loop over the following three steps L times to obtain a set of bootstrapped estimates of the parameters β and σ_ε; namely, $B = \left[\left(\hat{\beta}'^b, \hat{\sigma}_\varepsilon^b\right)\right]_{b=1}^{L}$

   3.1. For each tourist destination with $\widehat{\text{T}}\text{\&TCI-DEA}_d < 1$, draw ε_d^b from the following normal distribution:

   $$N(0, \hat{\sigma}_\varepsilon) \text{ right} - \text{truncated at point } \left(1 - \hat{\beta}' z_d\right)$$

   3.2. Compute $\widehat{\text{T}}\text{\&TCI-DEA}_d^b = \hat{\beta} z'_d + \varepsilon_d^b$, again for tourist destinations for which $\widehat{\text{T}}\text{\&TCI-DEA}_d < 1$.

   3.3. Estimate $\hat{\beta}^b$ and $\hat{\sigma}_\varepsilon^b$ by truncated regression and maximum likelihood using the artificial competitiveness scores computed in step 3.2 as the dependent variable.

4. Finally, use values in B and the original estimates to build a confidence interval for the parameters β and σ_ε.

The results are reported in Table 5[12], which includes two models: model 1 uses several socioeconomic and social variables, as well as the variable *Coast*; in addition to those variables, model 2 also incorporates a set of geographical dummies. Regarding socioeconomic features, the estimated signs for *Human Development Index* and *Globalisation Index* are positive and statistically significant, indicating that both variables boost the competitiveness of tourist destinations. Put more simply, advanced economies and countries that are more economically, socially and politically connected tend to have more competitive tourist

[12] The estimations have been carried out using Stata 15 software and the Stata module developed by Tauchmann (2016).

industries. Conversely, the estimated effect of the variable *Tourism and travel share in GDP* on competitiveness is not statistically significant in either of the two models, a result that is in line with Ivanov and Webster (2013). Furthermore, political features of countries such as stricter anti-corruption measures—the variable *Control of corruption*— and having a better democracy—the variable *Quality of democracy*— also enhance tourism competitiveness, although the impact of the quality of democracy is only significant in the second model, at the 10% confidence level. Although these effects are less robust in our estimations, they are also in line with previous literature; Das and Direnzo (2010), for example, explain how corruption tends to damage tourist destinations' brand image, thus negatively affecting competitiveness. Lastly, the variable *Coast* has no statistically significant impact on competitiveness in either of the two models estimated.[13]

Regarding the dummy variables representing the continent in which the tourist destinations are situated, note that the omitted dummy is *North America*. That said, estimated coefficients for *Europe*, *Oceania*, *Latin America and the Caribbean*, *Asia* and *Africa* are all negative and statistically significant at the 1% confidence level, meaning that being located in a geographical area other than North America reduces the competitiveness of tourist destinations. Furthermore, according to the marginal effects from model 2, tourist destinations in Africa and Latin America and the Caribbean are the less competitive ones when compared with North America, as already illustrated by Lee (2015).

In summary, our results concerning the determinants of our T&TCI-DEA indicator are comparable to those obtained in previous research using the T&TCI-WEF as the dependent variable; however, this was a result that could have reasonably been expected, given the high correlation between the two composite indicators of competitiveness.

Table 5. Second-stage analysis: Explaining the T&TCI-DEA

	Model I	Model II
Constant	0.1447***	0.3243***
	(0.0440)	(0.0726)
Tourism and travel share in GDP	0.0024	0.0026
	(0.0020)	(0.0019)
Human Development Index	0.2918***	0.2138**
	(0.0799)	(0.0915)
Globalisation Index	0.0016**	0.0019**
	(0.0008)	(0.0008)

[13] As an alternative, the inclusion of a variable representing, for example, the quality of beaches could have led to different results. However, we do not have information on this variable for all the countries in the sample.

Control of corruption	0.0160*	0.0154*
	(0.0093)	(0.0092)
Quality of democracy	0.0056	0.0073*
	(0.0039)	(0.0041)
Coast	0.0160	0.0132
	(0.0138)	(0.0132)
Europe	-	-0.1562***
		(0.0361)
Oceania	-	-0.1520***
		(0.0549)
Latin America and the Caribbean	-	-0.1564***
		(0.0380)
Asia	-	-0.1367***
		(0.0373)
Africa	-	-0.1649***
		(0.0402)
Sigma	0.0638***	0.0591***
	(0.0039)	(0.0035)
Wald Chi-squared	272.20***	327.04***

****, ** and * stand for statistical significance at 1%, 5% and 10% confidence levels, respectively. Standard errors are in brackets. The number of bootstrap replications has been set at 5000.*

5. Summary, concluding remarks and suggestions for further research

In this paper, we calculate a weighted aggregate composite indicator of the competitiveness of 136 international tourist destinations, with data from the 2017 edition of the *Travel & Tourism Competitiveness Report* produced by the World Economic Forum. Our principal contribution to existing literature in this field of research is that the weights assigned to raw indicators, pillars and sub-indexes in building the aggregate indicator are endogenously generated. These weights are computed using *Data Envelopment Analysis* and the so-called *Benefit-of-the-Doubt* principle. Most notably, this approach allows each tourist destination to be assigned the weighting scheme that places it in the most favourable position when compared with all other destinations in the sample assessed according to the same set of weights. Moreover, this paper also contributes a ranking of tourist destinations according to their competitiveness, obtained by combining *Data Envelopment Analysis* with *Multi-Criteria Decision-Making* techniques. This ranking is compared with that resulting from the unweighted composite indicator of competitiveness directly provided by the World Economic Forum. Finally, truncated regression and bootstrapping are used to explore the determinants of the competitiveness of tourist destinations.

Regarding the main results, optimal weights reveal that the endowment of natural and cultural resources contributes the most to our composite indicator of the competitiveness of tourist destinations, highlighting the importance of such features in attracting international tourists. At the opposite extreme, the enabling environment makes the smallest contribution. The United States is found to be the most competitive tourist destination, followed by China, Spain, France and Germany; all of these are mature destinations boasting good infrastructure, as well as plenty of natural and cultural resources. Moreover, more competitive destinations are also found to generate greater added value per visitor. Conversely, the five least competitive destinations are mostly African developing economies, and include Yemen, Burundi, Chad, Congo DR and Sierra Leone. Furthermore, the ranking of tourist destinations according to our weighted competitiveness indicator is pretty similar to that produced from the unweighted indicator provided by the World Economic Forum. Finally, we have also found that countries' level of development, their degree of international connection, the quality of democracy or stricter anti-corruption laws, all boost the competitiveness of international tourist destinations.

In addition to the approach proposed in this paper to compute a weighted composite indicator of the competitiveness of international tourist destinations, it is our belief that our empirical results could help to improve the management of destinations. In this respect, quantifying destinations' competitive positions with respect to different indicators could provide policymakers and tourist firm managers with sound information that would help them to identify strengths and weaknesses and pinpoint the factors that restrict their ability to attract international tourists. Furthermore, there is room for future research focused on exploring the competitiveness of tourism destinations with composite indicators. In this respect, it seems crucial to gain a deeper understanding of the variables determining tourist destinations' ability to attract international tourists, and thus their competitiveness. Furthermore, beyond the existing proposals on this matter, new composite indicators that can assign different weights to the determinants of competitiveness according to their relative importance would also be particularly welcome, as they represent useful tools for improving the management of tourist destinations.

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Appendix 1. Second-stage variables: description, sources and descriptive statistics

Variable	Description	Source	Average	Standard deviation
Tourism and travel share in GDP	Tourism and travel industry share in country GDP (%)	World Economic Forum	4.14	2.79
Human Development Index	Human Development Index (2015); between 0 (lowest development) and 1 (highest development)	United Nations Development Programme	0.731	0.147
Globalisation Index	KOF Index of Globalization, including economic, social and political globalization (2015); between 0 (lowest globalization) and 100 (highest globalization)	KOF Index of Globalization. KOF Swiss Economic Institute	64.082	15.146
Control of corruption	Control of corruption (2015); between -2.5 (lowest control) and 2.5 (best control)	WGI Project. The World Bank Group	0.088	1.010
Quality of democracy	Unit's Democracy Index (2015); between 0 (authoritarian regime) and 10 (full democracy)	Economist Intelligence Unit	5.982	2.038
Coast	Dummy coded 1 for countries with coast and 0 otherwise	Own elaboration based on CIA - World Factbook	0.772	0.421
Europe	Dummy coded 1 for countries in Europe and 0 otherwise	Own elaboration based on the United Nations classification	0.293	0.457
Oceania	Dummy coded 1 for countries in Oceania and 0 otherwise	Own elaboration based on the United Nations classification	0.015	0.121
Latin America and the Caribbean	Dummy coded 1 for countries in Latin America and the Caribbean and 0 otherwise	Own elaboration based on the United Nations classification	0.147	0.355
Asia	Dummy coded 1 for countries in Asia and 0 otherwise	Own elaboration based on the United Nations classification	0.272	0.447
Africa	Dummy coded 1 for countries in Africa and 0 otherwise	Own elaboration based on the United Nations classification	0.251	0.435
North America	Dummy coded 1 for countries in North America and 0 otherwise	Own elaboration based on the United Nations classification	0.022	0.147

Appendix 2. Rankings of tourist destinations+ according to their competitiveness: sub-indexes and global indicator

	DEA-MCDM							DEA-MCDM					
Destination	Sub-index A	Sub-index B	Sub-index C	Sub-index D	T&TCI-DEA	T&TCI-WEF	Destination	Sub-index A	Sub-index B	Sub-index C	Sub-index D	T&TCI-DEA	T&TCI-WEF
United States	21	61	1	1	1	6	Taiwan	28	38	40	39	35	30
China	60	83	18	2	2	15	Malaysia	39	26	41	37	36	26
Spain	27	9	10	3	3	1	Turkey	68	73	44	16	37	44
France	23	20	7	4	4	2	Thailand	66	48	39	25	38	34
Germany	16	19	3	6	5	3	Estonia	17	8	45	88	39	37
Japan	4	22	12	8	6	4	Panama	65	23	34	50	40	35
United Kingdom	15	60	4	9	7	5	Bulgaria	41	28	49	40	41	45
Italy	48	47	17	5	8	8	Cyprus	51	21	36	70	42	52
Australia	19	45	20	12	9	7	Indonesia	94	7	77	21	43	42
Austria	22	15	9	20	10	12	Slovenia	35	24	46	63	44	41
Korea Rep.	14	51	19	13	11	19	Russian Fed.	54	100	43	24	45	43
Canada	25	74	5	14	12	9	Hungary	49	16	47	57	46	49
Portugal	32	3	21	18	13	14	Costa Rica	59	36	62	30	47	38
Switzerland	1	41	8	29	14	10	Poland	52	27	60	43	48	46
Iceland	10	12	2	67	15	25	Chile	55	13	65	44	49	48
Hong Kong	2	14	16	36	16	11	Peru	84	72	81	15	50	51
Greece	46	10	23	22	17	24	Mauritius	57	5	48	104	51	55
Singapore	7	1	11	89	18	13	Slovak	37	44	55	61	52	59
Belgium	20	42	15	27	19	21	Barbados	44	52	25	122	53	58
Mexico	73	55	51	11	20	22	Qatar	11	90	28	123	54	47
Croatia	40	31	33	17	21	32	Lithuania	31	33	53	102	55	56
Netherlands	12	25	14	51	22	17	Latvia	36	18	56	105	56	54
Norway	5	46	26	33	23	18	South Africa	85	86	52	28	57	53
Brazil	72	92	64	7	24	27	Colombia	91	66	93	19	58	62
Sweden	6	35	31	35	25	20	Dominican	102	2	59	82	59	76
United Arab Em.	18	68	6	62	26	29	Jamaica	82	6	57	91	60	69
Ireland	24	11	22	58	27	23	Ecuador	87	67	63	32	61	57
New Zealand	13	17	32	42	28	16	Romania	58	57	68	49	62	68
India	109	62	61	10	29	40	Israel	33	108	37	85	63	61
Czech Republic	30	29	24	48	30	39	Morocco	74	78	67	34	64	65
Denmark	8	34	29	55	31	31	Argentina	69	102	74	23	65	50
Luxembourg	9	32	13	111	32	28	Oman	42	104	58	47	66	66
Finland	3	30	35	60	33	33	Sri Lanka	80	49	73	53	67	64
Malta	29	4	27	84	34	36	Bahrain	26	96	38	134	68	60

Appendix 2. Rankings of tourism destinations[+] according to their competitiveness: sub-indexes and global indicator (*Continued*)

	DEA-MCDM							DEA-MCDM					
Destination	Sub-index A	Sub-index B	Sub-index C	Sub-index D	T&TCI-DEA	T&TCI-WEF	Destination	Sub-index A	Sub-index B	Sub-index C	Sub-index D	T&TCI-DEA	T&TCI-WEF
Vietnam	77	81	96	26	69	67	Uganda	119	88	116	56	103	106
Azerbaijan	43	80	71	65	70	71	Kuwait	45	122	78	136	104	100
Saudi Arabia	34	110	54	80	71	63	Rwanda	81	94	107	110	105	97
Georgia	50	71	69	96	72	70	Paraguay	101	75	111	127	106	110
Cape Verde	90	63	42	129	73	83	Zambia	115	99	118	75	107	108
Trinidad & Tob.	70	105	30	119	74	73	Bosnia & Herzeg.	78	109	95	130	108	113
Jordan	53	58	70	113	75	75	Zimbabwe	126	101	110	68	109	114
Uruguay	38	76	82	83	76	77	Gambia	110	85	108	117	110	112
Kenya	116	54	86	41	77	80	Ethiopia	117	106	114	73	111	116
Montenegro	63	84	50	114	78	72	Senegal	107	128	99	72	112	111
Guatemala	99	43	91	59	79	86	Venezuela	125	129	113	38	113	104
Namibia	86	82	66	71	80	82	Côte d'Ivoire	111	120	90	92	114	109
Tunisia	75	59	76	95	81	87	Madagascar	131	79	124	98	115	121
Philippines	97	64	97	52	82	79	Moldova	67	114	102	135	116	117
Tanzania	123	37	104	46	83	91	Mozambique	120	95	119	99	117	122
Bhutan	76	53	98	87	84	78	Tajikistan	93	117	115	100	118	107
Honduras	113	40	87	77	85	90	Pakistan	127	113	105	101	119	124
Armenia	61	93	80	93	86	84	Kyrgyz Republic	92	118	129	78	120	115
Kazakhstan	47	97	89	79	87	81	Algeria	96	132	120	76	121	118
Egypt	95	70	85	81	88	74	Ghana	104	123	109	112	122	120
Ukraine	83	89	72	94	89	88	Gabon	100	126	117	118	123	119
Macedonia	56	91	75	120	90	89	Mali	130	127	123	69	124	130
Cambodia	105	39	106	66	91	101	Malawi	122	112	131	97	125	123
Iran Islamic Rep.	89	115	101	31	92	93	Bangladesh	118	121	122	109	126	125
Lebanon	71	77	83	115	93	96	Nigeria	128	124	121	107	127	129
Nicaragua	112	50	94	86	94	92	Lesotho	106	111	133	131	128	128
Lao PDR	98	65	92	103	95	94	Cameroon	124	133	126	106	129	126
Mongolia	64	103	112	54	96	102	Benin	121	131	125	116	130	127
Serbia	62	107	79	108	97	95	Mauritania	132	119	128	126	131	132
Botswana	88	98	88	74	98	85	Sierra Leone	129	125	134	128	132	131
Albania	79	87	84	121	99	98	Congo DR	134	136	135	90	133	133
El Salvador	103	56	100	124	100	105	Chad	136	130	132	125	134	135
Bolivia	108	116	103	45	101	99	Burundi	133	134	136	133	135	134
Nepal	114	69	127	64	102	103	Yemen	135	135	130	132	136	136

[+] *Tourist destinations are ordered according to their global competitiveness assessed with the global* T&TCI-DEA.

CONCLUSIONES

A continuación, se acomete la síntesis de las principales conclusiones que se han alcanzado a lo largo del desarrollo de la presente tesis doctoral. En ellas se alude a las aportaciones generadas sobre la línea de investigación, las contribuciones metodológicas y las utilidades prácticas que del análisis de los resultados pueden concluirse, acerca del tema principal de esta investigación que es la evaluación de la eficiencia y competitividad de los destinos turísticos. A continuación se enumeran las principales contribuciones siguiendo esta triple perspectiva.

A. Hemos realizado una serie de aportaciones al desarrollo de la línea de investigación de evaluación de la eficiencia de los destinos turísticos, que pueden sintetizarse en las siguientes:

    1. Se han generado un total de cinco trabajos, que representan cinco supuestos de análisis diferenciados, y que contribuyen al fortalecimiento de la creciente vertiente empírica y metodológica de la línea de investigación de evaluación de la eficiencia y competitividad de los destinos turísticos.

    2. Respondiendo a la diversidad y complejidad dentro del sector turístico, hemos planteado diferentes propuestas analíticas. Se han llevado a cabo aportaciones en torno a la definición del objeto de estudio, en alusión al flujo turístico analizado (nacional o internacional y cultural o genérico), y a la escala de las unidades de análisis consideradas (regiones y países).

    3. Han sido estudiados distintos espacios geográficos, tales como Chile y América Latina y el Caribe, que hasta el momento no habían sido analizados en la literatura de referencia. Por otra parte, se acomete por primera vez, según nuestro conocimiento, un análisis de evaluación de la eficiencia en la gestión de los flujos turísticos de carácter estrictamente cultural, particularmente aplicado a los destinos turísticos regionales en España.

    4. De forma complementaria a la evaluación de eficiencia de los destinos turísticos, se ha construido un indicador sintético de competitividad turística basado en un esquema de pesos endógenos, por medio del modelo DEA en su orientación del "Beneficio de la Duda", que nos permite extraer conclusiones de la acumulación de los atractivos turísticos que poseen los destinos.

B. Fruto de la realización de los diferentes trabajos empíricos, se han generado varias contribuciones metodológicas y conceptuales sobre el procedimiento de evaluación de la eficiencia y la competitividad de los destinos turísticos:

    1. A lo largo de los diferentes trabajos hemos propuesto dos alternativas conceptuales, bien diferenciadas, de la hipótesis de proceso de optimización del flujo

turístico por parte de los destinos. Por un lado, la consideración de una función de producción compleja, en la que se trata de explicar el flujo turístico propiamente cultural, en base a los recursos culturales presentes en los destinos (trabajo en el sector turístico, patrimonio cultural, festivales y museos). Por otro lado, y siguiendo la metodología más aplicada se ha empleado, una función de producción simple o puramente gerencial, en la que se analiza la optimización del flujo turístico, de acuerdo a únicamente recursos turísticos (capacidad de alojamiento y llegadas de turistas).

2. Con respecto a las herramientas metodológicas empleadas, se ha alcanzado un significativo desarrollo del planteamiento estadístico y econométrico, ya que se ha recorrido, desde la aplicación de metodologías de análisis de segunda etapa, combinando DEA con modelos de regresión truncados (Tobit, Tobit robusto y bootstrap), a modelos más refinados desde el punto de vista estadístico, como es el proceso de doble bootstraping de Simar y Wilson (2007). Esta aproximación genera unos resultados libres de sesgos, y por ello se considera uno de los modelos más adecuados para el análisis de la eficiencia en la gestión turística y el contraste de los efectos que generan los factores ambientales o externos.

3. Además, se ha propuesto una metodología alternativa de medición de la competitividad turística, aplicando el DEA en su orientación "Beneficio de la Duda", para la construcción de un indicador sintético cuyos resultados se combinan con técnicas multicriterio, a fin de obtener un ranking de la competitividad de una muestra de destinos turísticos internacionales. Esta aplicación constituye una novedad en sí misma, puesto que no tenemos constancia de ninguna referencia que construya indicadores compuestos de competitividad según una aproximación de pesos endógenos, como el resultante de nuestro estudio. De forma complementaria a la construcción de este índice, se ha cuantificado el efecto positivo de fenómenos como la globalización, el desarrollo económico y el control de la corrupción, entre otros, sobre la competitividad turística, por medio del proceso de doble bootstrap de Simar y Wilson (2007).

C. Fruto de las diferentes aplicaciones y trabajos realizados, se ha contribuido a generar conocimiento sobre la competitividad de los destinos turísticos, que a su vez se materializan en utilidades prácticas de interés para los investigadores y los gestores involucrados en este sector:

1. Podemos afirmar que el modelo de eficiencia condicionada en dos etapas es una metodología válida para medir el rendimiento en la gestión de los destinos turísticos. Ha quedado patente su capacidad para adaptarse a diferentes contextos y

ajustarse a la escala de las unidades de toma de decisión, además de a variados planteamientos de proceso productivos, lo que le dota de una gran versatilidad práctica.

2. Se ha evidenciado que la acumulación de recursos culturales posee un efecto determinante considerable, pero contrapuesto, tanto sobre el flujo de turismo de motivación cultural, como sobre el flujo turístico sin motivación específica. Para el flujo de turistas, cualquiera que sea su motivación, los recursos culturales son un factor que determina claramente y de forma positiva su atracción. Mientras que para los turistas culturales, la acumulación de una mayor cantidad de recursos culturales tiende a perjudicar la eficiencia. La explicación a este efecto viene dado por el hecho de que los turistas culturales, y específicamente los domésticos, tienden a evitar las zonas más aglomeradas, en relación a las que gozan de una mayor notoriedad cultural. Mientras que los turistas sin especificidad de motivación muestran un efecto contrario, y no se ven condicionados negativamente por los efectos de aglomeración turística.

3. En los estudios que se centran en el análisis del turístico internacional, los recursos culturales generan un efecto claramente positivo sobre la eficiencia de los destinos o su competitividad turística. Así se constata en los resultados de los trabajos realizados para las regiones de Chile y España, y para la muestra de países de América Latina y el Caribe. De ello podemos concluir, que los turistas foráneos se ven especialmente atraídos por los destinos turísticos de mayor notoriedad cultural y con más acumulación de recursos culturales.

4. Por el contrario, en los estudios que analizan el flujo de turistas domésticos y particularmente motivado por un interés cultural, la acumulación de recursos culturales genera un efecto negativo sobre la competitividad turística, algo que hemos podido observar en el caso de la evaluación de las regiones españolas. Este resultado muestra, de nuevo, que los turistas nacionales tienen a aquejar en mayor medida el efecto de la congestión turística, que se encuentra asociado a las áreas en las que se ubican los grandes iconos culturales, y que, a veces, ha generado un fenómeno de inflación hotelera, que dado el planteamiento de nuestra función de producción, provoca pérdidas de eficiencia y desempeño del destino turístico.

5. En referencia a los resultados de la eficiencia, se ha observado en líneas generales la existencia de un importante margen de mejora en la gestión de los destinos turísticos. Podemos afirmar que, según nuestros planteamientos, los destinos analizados pueden obtener un mayor nivel de output, dados sus recursos. Esto es especialmente evidente en los resultados de los trabajos que analizan los flujos de turismo foráneo. Estos resultados se pueden justificar por varios factores: en primer

lugar, por los efectos de la crisis económica, que ha retraído en cierta medida el impacto económico turístico que realizan los visitantes; en segundo lugar, por el aumento de destinos potenciales, cuya diversidad contribuye a los viajes multi-destino; y por último, a la sobredimensión de las infraestructuras turísticas, ya que los destinos han aumentado sus dotaciones hoteleras a un ritmo mayor que el de llegada de turistas, generándose una sobreabundancia de oferta hotelera.

6. Se ha constatado la importancia de otras variables externas sobre la eficiencia y competitividad turística. El entramado empresarial, cultural y turístico, resulta especialmente significativo para la atracción de turismo nacional, no siendo tan evidente este efecto sobre el flujo de visitantes foráneos. Por su parte, la infraestructura turística y de comunicaciones, presenta un efecto positivo para los turistas internacionales, pero negativo para los nacionales. Esto vuelve a reafirmar, el hecho de que los turistas domésticos huyen de las zonas congestionadas, mientras que los foráneos son más atraídos por los destinos con mejores infraestructuras y posibilidades de comunicación, ya que les ofrecen una experiencia más accesible.

7. El efecto significativo de múltiples factores externos, relacionados con la costa y consumos alternativos, constata el carácter omnívoro de los turistas internacionales. Lo que evidencia que estos tratan de diversificar sus consumos, a fin de alcanzar una experiencia completa en el destino receptor, en relación al mayor esfuerzo que supone el viaje que realizan.

8. Los resultados del indicador sintético de competitividad turística, constatan que los factores que en mayor medida contribuyen a posicionar en mejor situación a los destinos frente a sus rivales, son los relacionados con las dotaciones culturales, entendidas ahora en un sentido amplio, y los recursos naturales, seguidos de las infraestructuras turísticas. Por el lado contrario, las variables que menos peso tienen sobre la competitividad de los destinos son las relacionadas con la seguridad, higiene y condiciones generales del destino.

9. En cuanto a utilidades prácticas, se ha obtenido en cada uno de los trabajos diferentes rankings de competitividad que, aun con la cautela que deben interpretarse, permiten contrastar la posición relativa que ocupa un destino frente a sus rivales. El trabajo ofrece relevante información para identificar, de forma precisa, las fortalezas que contribuyen a la competitividad de los destinos y las debilidades que lo limitan

10. Por último, se ha contrastado la capacidad explicativa que poseen las diferentes metodologías aplicadas en nuestro trabajo para el conocimiento del sector turístico, y que justifican su empleo como herramienta, tanto de investigación como de gestión turística .

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