UNIVERSIDAD DE GRANADA

Los determinantes de la brecha de género en el empleo: un análisis empírico a escala regional

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A mi madre, Concha,

y a mi padre, Juan

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A modo de preámbulo

El trabajo que se presenta en las siguientes líneas es fruto de un proceso emocional, académico e investigador de muchos años. En mi caso, es realmente difícil poder compartimentar los diferentes ámbitos de la vida, de forma que cada uno de ellos está atravesado y unido a todos los demás. Por ello, al escribir estas páginas, no solamente soy académica e investigadora, sino que también soy alumna, profesora, hija, hermana, amiga, compañera, pareja, jienense y andaluza… y todo esto, por tanto, también forma parte de mi proceso y mi carrera de investigación y de mi forma de estar y habitar esta vida.

Esta tesis comenzó desde mucho antes que yo lo supiera. Tras una larga y compleja temporada en Menorca de camarera aparecí casi por casualidad en una pequeña librería encajada entre las hermosas calles del barrio de Gràcia (Barcelona). Aún con el agotamiento en el cuerpo y con un hambre feroz de lecturas y conversaciones que volvieran a reconectarme con mi parte más reflexiva e intelectual, cayó en mis manos *La subversión feminista de la economía* de Amaia Pérez Orozco. La chica que por entonces atendía en la librería Aldarull (hablamos del año 2014) me sonrió y me recomendó la lectura. Así fue como comenzó mi andadura hacia esta nueva forma de entender la economía.

Poco tardé en volver al sur (que siempre será mi centro) y en hablar con Fernando López sobre esta nueva adquisición. A Fernando lo conocí en el Máster de Cooperación y de Desarrollo que se impartía en la Universidad de Granada. Fue un "amor académico a primera vista", tras años sintiéndome la "oveja negra" en el mundo más convencional de la economía y del derecho, cruzarme con Fernando fue crucial y completamente revelador. Me enseñó otra forma de entender la disciplina económica, una mirada heterodoxa y multidisciplinar, que volvió a conectar en mí las ganas (anteriormente pérdidas) de ser economista. Así, entre vinos y boleros, debatimos y reflexionamos lo que hoy es en gran parte el marco teórico de esta investigación. Gracias Fernando, tutor y codirector de esta tesis, por ser maestro y referente, por creer en mí y poner los cimientos para que este sueño se haga por fin realidad.

El proceso no ha sido fácil, esta tesis doctoral está realizada sin beca de investigación, lo que ha requerido hacer múltiples malabares entre la elaboración y puesta en marcha de un plan de investigación y los trabajos de temporada en el campo y en la hostelería. Pero en enero de 2018 mi camino laboral daba un giro de 180 grados, era seleccionada para un contrato de investigación del Programa de Empleo Juvenil para trabajar como joven personal investigador en la Universidad de Granada. Así me incorporo por primera vez a la universidad, concretamente al Instituto de Desarrollo Regional (IDR), para realizar tareas relacionadas con el estudio del territorio en aras de indagar en los aspectos clave para la planificación socioeconómica y el desarrollo regional de Andalucía. Este contrato no sólo me proporciona la estabilidad económica para poder dejar de lado otros trabajos remunerados desligados del mundo académico, sino que también me proporciona un sinfín de herramientas que más tarde serán los pilares básicos de la parte empírica de esta investigación. Gracias José Antonio Camacho por confiar en mi para este puesto de trabajo y permitirme formar parte, al menos durante un tiempo, de ese gran equipo del IDR. Jesús, Bladimir, Lucas, Laura, Bárbara, Soraya y Álvaro, gracias, por ser realmente compañeros y compañeras, por marcarme el camino y por hacerme un hueco en un mundo tan complejo como a veces es el académico. Mención especial a mi amigo Jesús, por las noches del Lemmon, las mil conversaciones y tu apoyo constante.

Más tarde, entre datos y modelos, conozco Jorge Chica. Aún recuerdo la primera vez que lo vi en la Sala de Juntas del IDR, hablaba sobre algún Triatlón que por entonces se estaba organizando en Granada y pensé que desprendía una energía muy amable. Pero nuestra relación se forjaría unos meses después, cuando acudí a su despacho pidiéndole ayuda sobre un modelo econométrico bastante precario. Y a partir de entonces comenzamos a trabajar juntos. No sé si fue el destino o las causalidades (que no casualidades), pero al poco tiempo nos ofrecieron un proyecto donde nuestros perfiles eran totalmente complementarios. A través de este proyecto, *El coste de oportunidad de la brecha de género*, conocí al Jorge más compañero. Y de repente comenzaron a salir los artículos y las revisiones y más trabajos, y entendí y aprendí gracias a él algunas de las claves más importante del proceso de investigación. Gracias Jorge, codirector tan merecido de este trabajo, por tu paciencia, por tu acompañamiento y por enseñarme la humildad y la honestidad dentro de este mundo a veces tan individual y competitivo. Has

puesto toda la estructura para que esta tesis salga adelante, con todo el cariño y la cercanía que tanto te caracteriza. Te estoy enormemente agradecida.

No puedo olvidarme de otras compañeras y profesoras que han formado parte de este proceso. Consuelo Díaz, Carmen Lizárraga, Mª Ángeles Sánchez, Jesús Herrera, Astrid Agenjo, Rafa Cano, Juan González, Fernando Quero, Juan Antonio Rubio, Alberto Ruiz. Gracias por plantar una semilla en este trabajo. Tampoco puedo olvidarme de Rosella Nicolini, la persona que actualmente me abre las puertas de la Universidad Autónoma de Barcelona. En este tiempo trabajando juntas he aprendido la perseverancia y la constancia en el trabajo, y he conocido todo un nuevo campo de conocimiento que aspiro poder conocer e investigar próximamente. Gracias por la confianza.

Y, como decía al principio de esta presentación, este trabajo no hubiera sido posible sin toda la estructura familiar, emocional y política que me rodea. Así, esta tesis se la dedico a mi madre, Concha, y a mi padre, Juan. Cualquier persona que conozca mi relación con ellos puede entender perfectamente el porqué de esta dedicatoria. No sólo me han dado la vida, sino que me han acompañado y sostenido siempre, en los momentos más difíciles, cuando todo te abruma. Porque en este proceso de tantos años, pasan muchas cosas, y también, a veces, una se desmorona y quiere acurrucarse en las rodillas de su madre para que le diga que todo está bien, que todo pasa. Y vaya que si pasa. Gracias mamá, eres la persona más importante de mi vida, eres la ternura personificada, amor incondicional y cariño a raudales. Gracias papá, referente de mi vida, siempre. Me has enseñado el engranaje de los libros y de las lecturas, el deporte y una forma muy particular de entender la política. Nunca hubiera llegado hasta aquí sin vuestra ayuda.

También quiero agradecer a mi familia todo el apoyo que me han dado. A mi hermana Irene y a mi prima-hermana Montse, por darme la seguridad que a veces me falta, y estar siempre ahí, siempre. A mis sobrinos Oliver y Eric, por enseñarme la calma y la inocencia a través de sus ojos y por entender en todo momento que "aún tengo que seguir trabajando". A mis tías, Amalia y Carmen, por las mil velas puestas en todas las iglesias cada vez que mandaba un artículo y creer en mí, a ciegas, aún sin saber muy bien lo que hago. A mi tío Antonio, por su serenidad y cariño, has sido clave en muchos momentos de mi vida. Y a toda la familia Olivas, de donde salen mis raíces más auténticas, más allá de los libros y de los artículos, allí donde queda el pueblo y mi sierra.

Resumen

Resumen

La tesis doctoral que se presenta se enmarca en la modalidad de tesis por compendio de artículos, regulada a través del artículo 18.4 de las Normas Reguladoras de las Enseñanzas Oficiales de Doctorado y del Título de Doctor por la Universidad de Granada. Dicho artículo establece que "una tesis doctoral puede también consistir en el reagrupamiento en una memoria de trabajos de investigación publicados por el doctorando en medios científicos relevantes en su ámbito de conocimiento". Se trata de una opción específica para la elaboración y defensa pública de la tesis doctoral para la obtención del título de doctor o doctora. Por tanto, la tesis bajo el título *Los determinantes de la brecha de género en el empleo: un análisis empírico a escala regional* surge como una reagrupación de artículos publicados en tres revistas científicas de prestigio internacional indexadas en el Journal Citation Reports (JCR). Este título es el establecido originalmente por la doctoranda en el plan de investigación en línea con la publicación del primer artículo escrito y enviado a revisión que se presenta en esta tesis doctoral. Los resultados de la investigación permitieron seguir avanzando en el estudio dando lugar a otros dos trabajos más donde incorporamos nuevos hallazgos al debate de las desigualdades de género en el mercado laboral. Además, según este mismo artículo 18.4, "la tesis debe contar, al menos, con los siguientes contenidos: título, resumen, introducción, objetivos, metodología, conclusiones y bibliografía y los artículos que la componen, bien integrados como capítulos de la tesis o bien como un Anexo". La estructura de la presente tesis se ajustará a dichas prescripciones.

La presente tesis adopta como referente teórico el enfoque económico feminista, corriente de pensamiento económico que cuestiona al detalle la teoría económica neoclásica y propone alternativas de análisis, erigiéndose en verdadero paradigma

alternativo en su forma de abordar la realidad socioeconómica. Así, una de las propuestas de las economistas feministas es superar la forma de tradicional de analizar el mercado de trabajo, incluyendo el género como categoría central del análisis. Esto significa ampliar el concepto de trabajo, analizar la relación entre el trabajo de cuidados y las actividades mercantiles y considerar diversos aspectos de la participación y discriminación laboral de las mujeres. Si bien en la última década se ha producido una entrada progresiva de la mujer al mercado de trabajo, aún las desigualdades de género siguen siendo significativas. En efecto, la fuerte segregación ocupacional, las bajas tasas de empleo femeninas o las aún persistentes diferencias salariales, son algunas de las cuestiones que aún están lejos de corregirse.

Una de las motivaciones del estudio que se presenta fue conocer los mecanismos que inciden en un aumento del nivel de empleo, principalmente femenino, y, por ende, conocer también aquellos mecanismos que inciden en una disminución de las brechas de género en el mercado de trabajo en aras de mejorar la calidad de vida de las personas. Para llevar a cabo el análisis empírico sobre esta cuestión, se adoptaron las técnicas de econometría espacial. Esta metodología, además de analizar el efecto de variables socioeconómicas y laborales sobre las tasas de empleo femenina y masculina, permite considerar las interacciones espaciales entre las variables objeto de estudio. Así, obtuvimos una visión mucho más completa de las desigualdades de género en el mercado laboral y del comportamiento de los patrones de empleo en las distintas regiones.

Fruto de este planteamiento de análisis sobre el mercado de trabajo y las desigualdades de género surgen los dos primeros estudios que componen la presente tesis doctoral. El primero se titula "Regional characteristics of the gender employment gap: A spatio-temporal approach" y fue publicado en la revista *The Economic and Labour Relations Review,* en junio de 2021. En él se analiza la presencia de interacción espacial

en la brecha de género en el empleo en 727 municipios andaluces para el período 2012-2016, y se identifican algunas características de los municipios que pueden incidir sobre la brecha. Los resultados de este estudio revelaron que la brecha de género en el empleo en un municipio está influenciada por la brecha de los municipios vecinos y que existen determinados factores socioeconómicos y laborales que influyen sobre dicha brecha, tales como el número de personas dependientes, el índice de especialización en el sector servicios o el ingreso per cápita en una determinada región. Estos hallazgos aportan una valiosa información sobre los patrones de la brecha de género en el empleo en Andalucía y, además, pueden ser de gran utilidad a la hora de implementar políticas públicas a nivel regional tendentes a reducir las desigualdades de género en el mercado laboral, tanto en el área analizada como en otras áreas geográficas.

El segundo trabajo, titulado "Spatial impact of factors influencing the achievement of the *Europa2020* employment targets" y publicado en la revista *Papers in Regional Science,* en enero de 2021, analiza la presencia de interacción espacial en el cumplimiento del objetivo de empleo propuesto por la *Estrategia Europea2020.* Se diferencian por género 270 regiones europeas en el año 2017 y se identifica el impacto de ciertos factores, tales como la tasa de dependencia, el pib per capita o el nivel de educación, en la probabilidad de que dichas regiones alcancen el objetivo de empleo tanto para el caso masculino como femenino. Los resultados muestran que alcanzar la meta del empleo de *Europa2020* en una región tiene un impacto positivo en la consecución de la meta en las regiones vecinas tanto para el caso masculino como femenino. Además, los resultados relevan que existen determinados factores que influyen en el logro del objetivo desglosado por género. De nuevo, estos hallazgos tienes fuertes implicaciones desde el punto de vista político ya que muestran la necesidad de adoptar un enfoque espacial y de género en la aplicación de las políticas públicas de empleo e identifican los factores sobre

los que incidir para fomentar la participación laboral femenina y masculina en las regiones.

Una vez que identificamos, a través de los estudios analizados, los mecanismos que podían influir en un aumento de las tasas de empleo femenina y masculina desde el enfoque espacial, en aras de caminar hacia un mayor bienestar social de la población, nos encontramos con una segunda cuestión fundamental en nuestra investigación. En las últimas dos décadas, y en parte como resultado de la visión cuantitativa de aumentar las tasas de empleo, se han producido fuertes transformaciones en el mercado de trabajo. El deterioro de las condiciones laborales a través de la flexibilización de las formas de contratación y de remuneración han llevado al reconocimiento de un problema de calidad en el empleo como aspecto fundamental del desarrollo humano. Para integrar esta problemática en la presente tesis se adopta el enfoque del desarrollo humano a partir de las contribuciones de Amartya Sen y Martha Nussbaum, que relacionan positivamente la calidad del empleo con el objetivo de lograr una vida digna. Siguiendo este enfoque se incorporó al análisis del mercado laboral un indicador de calidad del empleo.

Así, el tercer estudio de nuestra investigación surge como una primera aproximación a esta cuestión. Con el título "The Impact of Employment Quality and Housing Quality on Human Development in the European Union" y publicado en la revista *Sustainability* en enero de 2021, en este artículo se analiza el impacto de la calidad del empleo y de la vivienda sobre el desarrollo humano en los 28 países que componen la Unión Europea en el período de estudio. Los resultados relevan que detentar un trabajo a tiempo parcial involuntario y vivir en condiciones de hacinamiento restringe la expansión de las capacidades humanas para que las personas lleven la vida que realmente desean. Los hallazgos de este estudio subrayan la importancia de considerar no solo los mecanismos que inciden en un aumento de la cantidad de trabajo en una región

determinada sino también identificar otros aspectos relacionados con las características de este trabajo, dada su influencia directa sobre las capacidades para que las personas puedan hacer y ser lo que realmente desean. Esta primera aproximación al estudio de la calidad del empleo nos ha permitido asentar las líneas futuras de investigación. Así, abordar el análisis desde una doble perspectiva cuantitativa y cualitativa nos proporcionará visión más amplia del mercado laboral y una mejor explicación de las desigualdades de género en el mercado de trabajo.

A continuación, se presenta una tabla resumen de los tres trabajos científicos publicados y que forman parte de la modalidad por compendio de publicaciones elegida en este estudio para la presentación de la tesis doctotal (tabla 1).

Tabla 1. Indicios de calidad de los trabajos científicos publicados

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Autores: Chica-Olmo, Jorge; Checa-Olivas, Marina; López Castellano, Fernando.
Título: Regional characteristics of the gender employment gap: A spatio-temporal approach
Referencia: DOI:10.1177/10353046211023242, 1-19 June (2021)
Revista: The Economic and Labour Relations Review

Editorial: SAGE
Factor de Impacto: 1.571 / 2.399 (5-Year)
Posición:

      Journal Citation Indicator (JCI-2020)
     132/549 ECONOMICS (Q1)
      19/51   INDUSTRIAL RELATIONS & LABOR (Q2)
     Journal Impact Factor (JIF-2020)
     232/377 ECONOMICS (Q3)
       20/30 INDUSTRIAL RELATIONS & LABOR (Q3)

Revisión por al menos 2 expertos independientes

Autores: Chica-Olmo, Jorge; Checa-Olivas, Marina.
Título: Spatial impact of factors influencing the achievement of the Europa2020 employment targets
Referencia: DOI: 10.1111/pirs.12592, 2021;100:633–649.
Revista: Papers in Regional Science

Editorial: WILEY
Factor de Impacto: 2.858 / 2.835 (5-Year)
Posición:

     Journal Citation Indicator (JCI-2020)
     143/549 ECONOMICS (Q2)
      22/51   REGIONAL & URBAN PLANNING (Q2)
     Journal Impact Factor (JIF-2020)
     102/377 ECONOMICS (Q2)
      23/40   REGIONAL & URBAN PLANNING (Q3)

Revisión por al menos 2 expertos independientes

Autores: Checa-Olivas, Marina; De la Hoz-Rosales, Bladimir; Cano-Guervos, Rafa
Título: The Impact of Employment Quality and Housing Quality on Human Development in the European Union
Referencia: DOI: 10.3390/su13020969, 2021, 13, 969.
Revista: Sustainability

Editorial: MDPI
Factor de Impacto: 3.251 / 3.473 (5-Year)
Posición:

     Journal Citation Indicator (JCI-2020)
     124/274 ENVIRONMENTAL SCIENCES (Q2)
      60/125 ENVIRONMENTAL STUDIES (Q2)
     Journal Impact Factor (JIF-2020)
     124/274 ENVIRONMENTAL SCIENCES (Q2)
      60/125   ENVIRONMENTAL STUDIES (Q2)

Revisión por al menos 2 expertos independientes

Fuente: Web of Science, Journal Citation Reports (Clarivate Analytics).

Listado de figuras y tablas

Acrónimos

AIC: Akaike Information Criterion

EU: European Union

EUROSTAT: European Statistical Office

FE: Fixed-effects

FGLS: Feasible Generalised Least Squares

GDP: Gross domestic producto

HCA: Human Capabilities Approach

HDI: Human Development Index

IAFFE: lnternational Association of Feminist Economics

IECA: Instituto de Estadística y Cartografía de Andalucía

ILO: International Labour Organization

INE: Instituto Nacional de Estadística

ITCV: Impact Threshold for a Confounding Variable

LM: Test Lagrange Multiplier

LR: Test Likelyhood Ratio

OECD: Organisation for Economic Cooperation and Development

PCSE: Panel-Corrected Standard Errors

PT: Portal de Transparencia de la Administración General del Estado

RE: Random-effects

SAR: Spatial Autoregressive

SDM: Spatial Durbin Model

SEM: Spatial Error Model

SEPE: Servicio Público de Empleo Estatal

UN: United Nations

UNDP: United Nations Development Programme

VIF: Variance Inflation Factor

Capítulo 1:
Introducción

Capítulo 1. Introducción

En las décadas de los años 60 y 70 del siglo XX, en un contexto de auge de los movimientos sociales, surge la denominada segunda ola del feminismo. A diferencia de la primera ola, que enfatizaba en la superación de obstáculos legales y en la búsqueda de la igualdad a través del sufragio femenino o de los derechos de propiedad, en esta etapa se redefinen conceptos claves para el análisis feminista (Checa-Olivas y Díaz-Consuelo, 2017). Diversas autoras subrayan que las estructuras económicas y sociales subordinan a las mujeres por razón de sexo, de ahí que clamen por una transformación de las relaciones de poder tanto en la esfera pública como en el ámbito privado. Sus aportaciones en el terreno de la sexualidad y de los derechos de reproducción fueron fundamentales para su empoderamiento (Cabrera y Escobar, 2014)

La corriente económica de la economía feminista surge a la estela de estas reivindicaciones. Un hito de gran importancia, en este sentido, es la Conferencia anual de la American Economic Association en 1992 donde se incorpora por primera vez un panel vinculado directamente con el análisis feminista en la economía (Ferber y Nelson, 1993). El impacto de esta nueva corriente se refleja en la creación de la lnternational Association of Feminist Economics (IAFFE) en 1992, y la publicación de la revista Feminist Economics (Benería, 1999), en la que, por primera vez, se abordan debates en torno a la economía feminista. También algunas autoras señalan como un hito fundamental el desarrollo del enfoque de las capacidades de Amartya Sen y Martha Nussbaum formulado a partir de la década de los años 80, que supuso una importante fuente de inspiración (Agenjo, 2011).

Dentro de esta corriente de pensamiento existe una amplia variedad de aproximaciones en función del grado de ruptura planteado con la economía convencional (Carrasco, 2006). En este sentido, se puede hablar de "economía feminista integradora"

y de "economía feminista de la ruptura". La primera pretende visibilizar el trabajo realizado en los hogares, sacando al ámbito monetizado las esferas invisibles de la economía. Su propuesta se basa en la corresponsabilidad de las tareas realizadas por ambos sexos tanto en la esfera doméstica como en la esfera extradoméstica, para poner fin a la división sexual del trabajo. Por su parte, la "economía feminista de la ruptura" visibiliza la existencia de un conflicto entre el capital y la vida, es decir, de un conflicto social entre la lógica del beneficio del mercado y la lógica de la sostenibilidad de la vida (Agenjo, 2011, Checa-Olivas y Díaz-Escobar, 2017). Esta mirada rompe conceptual, metodológica y políticamente con el corsé del pensamiento dualista y masculinizado del sistema socioeconómico.

Sin embargo, aunque existen diversas aproximaciones analíticas que forman parte del cuerpo de pensamiento de la economía feminista, podemos destacar una serie de elementos comunes sobre los que pivotan las diferentes perspectivas (Agenjo y Pérez-Orozco, 2017). En primer lugar, pretenden dar una definición más amplia de lo económico de forma que se incluya a las actividades invisibilizadas históricamente realizadas por las mujeres. En segundo lugar, parten del papel clave de la variable "género" y de su incorporación como categoría central del análisis económico. Y, en tercer lugar, consideran necesario asumir un compromiso ético-político en el desarrollo de medidas macroeconómicas que transformen las desigualdades existentes en el sistema socioeconómico (Gálvez, Rodríguez, Agenjo, Del Moral y Vega, 2016; Pérez-Orozco, 2005).

Se trata, por tanto, de una corriente crítica de pensamiento económico que deconstruye la mirada del paradigma económico dominante e incorpora ciertas dimensiones en el marco de análisis. Efectivamente, la visión dominante de la economía, basada en las premisas de la corriente neoclásica, considera al libre mercado y a la

competencia como garantes de la eficiencia y de la productividad (Agenjo-Calderón y Gálvez-Muñoz, 2019). Esta disciplina presenta a la economía como una ciencia exacta, objetiva y universal sobre la base de un individualismo metodológico que parte de una asignación de recursos eficiente y racional.

Muchas han sido las académicas feministas que han criticado las lógicas y el método del paradigma neoclásico. Los estudios de Pichio (1999), Ferber y Nelson (1993), Carrasco (1999), Robeyns (2000), Fraser (2015, 2020) entre otros, deconstruyen el sesgo androcéntrico y reduccionista de este enfoque y plantean una perspectiva más amplia de la economía donde la vida de las personas se coloque en el centro. De esta forma, se dotan de un ambicioso aparato conceptual y analítico donde buscan una comprensión más integral y humana de la economía y de los procesos de inclusión y exclusión que en ella se desarrollan (Agenjo-Calderón y Gálvez-Muñoz, 2019; López, 2021). Así, una de las grandes preocupaciones de las economistas feministas ha sido colocar el trabajo de cuidados y doméstico en el foco analítico adecuado, ya que permite examinar con mayor profundidad el papel que las mujeres desempeñan en la actividad económica y las inequidades de género que se producen en el ámbito laboral (Benería y Floro, 2016; Power, 2013). Esta corriente de pensamiento económico ha realizado importantes contribuciones teóricas y empíricas en el marco de la disciplina económica, lo que ha permitido instaurar una nueva hoja de ruta en los debates actuales sobre economía, sociedad y mercado de trabajo (Carrasco, 2006).

En el ámbito laboral, uno de los fenómenos más relevantes que ha tenido lugar en los países desarrollados en las últimas décadas ha sido la creciente incorporación de la mujer al mercado de trabajo (Cebrián y Moreno 2008; OECD 2019). En la Unión Europea, el incremento en la participación laboral femenina se ha traducido en un aumento de la tasa de actividad femenina de un 54,8% a un 72,6% de 1992 a 2018. En

España y en Andalucía los datos también reflejan este cambio, con un aumento de la tasa de actividad femenina de un 20% en el período contemplado (European Commission 2019; OECD 2019).

La evolución favorable de la participación de las mujeres en el mercado laboral, la dinámica creciente del empleo femenino, singularmente en el sector público, el gran retroceso experimentado por las tasas de desempleo desde principios de los años noventa o la incorporación progresiva a ocupaciones asociadas a una elevada cualificación, son expresiones de los avances alcanzados por las mujeres en el mercado de trabajo (Bover 1997; Mayordomo y Domínguez 2006). El papel del movimiento feminista desde la década de los setenta en aras de conquistar la emancipación femenina y la transformación estructural que propició el auge del sector servicios, se aducen como circunstancias favorables a este avance (Goldin 2006; Henkens, Grift, and Siegers 2002; Maruani 2002). Sin embargo, pese a la progresiva incorporación de la mujer al mercado de trabajo, aún siguen existiendo diferencias significativas por género (Carrasco 1999; Peetz y Georgina 2017).

Desde la corriente de la economía feminista y otros estudios económicos de género se han analizado de manera exhaustiva estas desigualdades de mujeres y hombres en el mercado de trabajo. Las investigaciones han evidenciado que, efectivamente, existe una inequidad de género en el mercado laboral fruto de las lógicas propias del mercado laboral que provocan dinámicas discriminatorias (Rodríguez, 2010) y, además, como consecuencia del fuerte condicionante que aún supone para las mujeres las responsabilidades familiares (Francavilla y Giannelli 2013; Kelly, Ammons, Chermack, y Moen, 2010). Otros estudios como el de Gálvez y Rodríguez (2013) analizan los efectos diferenciales que las crisis económicas tienen sobre hombres y mujeres, dando

evidencia del elevado efecto expulsión de mano de obra femenina durante las recesiones.

Una de las dinámicas que perduran en el mercado de trabajo es la segregación ocupacional, que constituye un factor determinante de la calidad del empleo femenino y de su evolución ya que se manifiesta en una mayor desigualdad en los ingresos (Gauchat, Kelly, y Wallace 2012). La tipificación de las ocupaciones como "femeninas" suele reflejarse en la alta participación de las mujeres en el sector terciario, fundamentalmente en actividades que en cierto sentido reproducen las tareas reproductivas (Rodríguez, 2010). Además, también siguen existiendo barreras que dificultan la promoción profesional de las mujeres a puestos de responsabilidad, fenómeno conocido como "techo de cristal" (glass ceiling) (Segerman-Peck, 1991). Los trabajos de Barberá, Ramos y Sarrió (2000) y Sarrió, Barberá, Ramos y Candela (2002) o algunos más recientes como Yagüe-Perales, Pérez-Ledo y March-Chordà (2021) han evidenciado la la subrepresentación de las mujeres en las posiciones ejecutivas. De manera análoga, otro de los fenómenos que siguen afectando a las mujeres en su inserción laboral es el denominado "piso pegajoso" (sticky floor) (Noble, 1992), que describe las dificultades que tiene el género femenino para acceder a puestos de trabajo de nivel intermedio o para desarrollarse en el mundo laboral. Ambas situaciones (glass ceiling y sticky floor) reflejan las fuertes desigualdades existentes aún en el mercado de trabajo.

Otra manifestación de la segregación en el mercado laboral se refleja en términos de sobrerepresentación femenina en trabajos a tiempo parcial (Castellano y Rocca 2019; Cha 2013; Haveman y Beresford 2012). En principio se puede afirmar que la feminización de los contratos parciales se debe a que muchas mujeres no disponen de tiempo por la carga que tienen de trabajo doméstico y de cuidados (Mayordomo y

Domíngue, 2006). Las académicas feministas han argumentado que la dedicación de las mujeres al trabajo no remunerado en el hogar las perjudica en el mercado laboral (Cutillo y Centra 2017; Song y Dong 2018; Tijdens, 2002) en cuanto que las obligaciones domésticas las llevan a aceptar empleos de baja remuneración y de menor estatus (Haveman y Beresford 2012; Shin 2012). De ahí que numerosas investigaciones se hayan centrado en el estudio del negativo efecto de las responsabilidades domésticas sobre la inserción laboral femenina como determinante estructural de las inequidades de género (Cukrowska-Torzewska, 2016; Cutillo y Centra 2017; Osnowitz 2005). La cantidad de tiempo del trabajo doméstico aumenta exponencialmente con la presencia de personas dependientes (Baxter, Hewitt, y Haynes 2008; Craig 2006). Según Moen y Yu (2000), el cuidado se refiere tanto a la atención de los niños, como al resto de personas mayores dependientes. Como las mujeres son las que brindan la mayor parte de esta atención, en aquellas regiones de rápido envejecimiento y con un número alto de niños menores, el sexo femenino tiene un nivel de participación en el empleo menor al de sus análogos masculinos (Noback, Broersma, y Van Dijk, 2013).

La discriminación hacia las mujeres en el mercado laboral tiene su correlato en las coberturas sociales, en tanto que las mismas se estructuran fundamentalmente a partir de la situación ocupacional de las personas (Rodríguez, 2010). Las desfavorables condiciones laborales con las que se encuentra el género femenino en su inserción en el mercado de trabajo explican en una parte sustantiva su posición económica subordinada y su falta de autonomía. Entender el vínculo entre las relaciones de género y el mercado de trabajo es imprescindible para comprender cabalmente la dinámica económica y reconocer los factores determinantes de estas desigualdades.

Desde una perspectiva multidimensional, el trabajo, como medio fundamental de combatir la pobreza, la desigualdad y dignificar la vida de las personas, se convierte en uno de los pilares del desarrollo humano.

A partir de los años setenta se produce un cambio en los contenidos de los estudios de desarrollo. Se deja atrás la perspectiva economicista basada en las tradicionales teorías modernizadoras para avanzar hacia una visión integral del desarrollo íntimamente relacionado con el bienestar personal y las capacidades individuales del ser humano (Sen, 1987, 1999).

Desde sus inicios, tras la segunda guerra mundial, la economía del desarrollo se había ocupado fundamentalmente del crecimiento económico, entendiendo que a través de este las sociedades incrementarían su bienestar general. Entre otros autores, Lewis (1958) o Rostow (1960) proponían transformar las estructuras socioeconómicas para superar la pobreza a través del incremento del Producto Interior Bruto. Esta visión se mantuvo durante décadas donde el desarrollo se identificaba con el crecimiento, y la renta per cápita como su indicador.

Sin embargo, a partir de la década de los 80, el desarrollo comienza a percibirse como un proceso que va más allá del aumento de la renta disponible. Amartya Sen se aleja de las premisas utilitaristas que fundamentaban la economía del desarrollo (Griffin, 2001) y postula un nuevo concepto basado en las capacidades humanas (Sen 1984, 1985; Nussbaum, 2000). Para Sen, la ampliación de la capacidad del ser humano tiene gran importancia para conseguir el desarrollo en una doble vertiente. Por un lado, permite estimular la productividad y contribuir a controlar razonablemente el cambio demográfico. Por otro, afecta el ámbito de las libertades humanas, del bienestar social y de la calidad de vida, tanto por su valor intrínseco como por su condición de elemento constitutivo de este ámbito. (Sen, 1998).

Así, los aportes teóricos de Sen lo han llevado ha considerarlo como uno de los principales teóricos del desarrollo humano (Robeyns, 2017). Su contribución se centra en tres conceptos fundamentales: capacidades, funcionamientos y agencia. Las capacidades son lo que las personas tienen la libertad de hacer, es decir, con las oportunidades de llevar la vida que realmente deseen; los funcionamientos se entienden como lo que las personas realmente pueden hacer o ser, y la agencia es la capacidad de las personas para perseguir los objetivos que se han fijado voluntariamente (Alkire, 2005). A partir de estos conceptos se configura una perspectiva del desarrollo humano fundada en la idea de un desarrollo que pone en el centro las libertades y capacidades positivas de los individuos (Sen, 1999; Nussbaum, 2012) y en una transformación del enfoque tradicional vinculado a la medición del desarrollo en base al crecimiento económico.

Desde el enfoque del desarrollo humano, el acto de trabajar es considerado como un funcionamiento que genera bienestar ya que nos permite acceder a los recursos necesarios para lograr un nivel de vida digno (UNDP, 2016). Así, haciendo uso de la capacidad que tienen las personas de insertarse al mercado laboral, se lleva a cabo el funcionamiento de acceder a un empleo o de trabajar en el mercado laboral (Checa-Olivas, De la Hoz-Rosales y Cano-Guervos, 2021).

En esta línea, una de las grandes preocupaciones del enfoque del desarrollo humano ha sido redefinir el concepto de trabajo atendiendo a las cuestiones cualitativas que forman parte de este. Este paradigma se caracteriza por reconocer que no hay una relación automática entre el trabajo y el desarrollo humano ya que no todas las formas de empleo pueden contribuir a mejorar el bienestar de las personas (Leßmann, 2012). Existen algunas formas de empleo, como pueden ser el empleo a tiempo parcial y las diferentes clases de contratos temporales, que restringen la expansión de capacidades para que las personas puedan hacer y ser lo que realmente desean (Robeyns, 2017). Una de estos

empleos, cada vez más generalizado en el mercado laboral, es el empleo a tiempo parcial involuntario. Según la OCDE (2010), este empleo se define como el trabajo a tiempo parcial que realizan los trabajadores como consecuencia de no haber podido encontrar un trabajo a tiempo completo a pesar de desearlo. Numerosas investigaciones analizan el empleo parcial involuntario como indicador de la calidad del trabajo que tienen las personas en un determinado territorio (Pavlopoulos, Fouarge, Muffels, y Vermunt, 2014; Filandri y Struffolino, 2019). Los resultados de estos estudios muestran la relación directa entre el empleo parcial involuntario y la pobreza laboral de los trabajadores en tanto que se trata un trabajo mal pagado que se realiza únicamente por una cuestión de subsistencia.

En línea con las contribuciones de Sen (1999) y Nussbaum (2012) y con la categorización de funcionamientos realizada por Robeyns (2005) se desprende que este tipo de empleo es un funcionamiento forzado, es decir, se ejecuta por obligación (De la Hoz, 2019). Se trata de un funcionamiento que restringe la agencia de la persona que lo realiza ya que carece de la libertad de elegir el empleo que le gustaría por la falta de oportunidades de empleo alternativas adecuadas (Gregory, Salverda y Bazen, 2000; Lucifora, McKnight y Salverda, 2005). En palabras de Sen (1988) no existe libertad de elección sobre el logro alcanzado en tanto que esta forma de empleo se lleva a cabo sin que otras alternativas estén disponibles. Por todo esto, las características relacionadas con la calidad del empleo suponen un importante factor explicativo de las capacidades y funcionamientos que pueden generar los individuos, ya que tienen en cuenta cuáles son los elementos necesarios para que un trabajo facilite a las personas llevar la vida que realmente desean (Gregory, Salverda y Bazen, 2000),

En definitiva, analizar el empleo desde el enfoque del desarrollo humano implica reconocer las características del trabajo que influyen en la capacidad del individuo (Leßmann y Bonvin, 2011). Por lo tanto, además de considerar en el análisis la cantidad

de empleo, incorporar ciertos indicadores de calidad del empleo desde este enfoque brinda una visión más amplia del mercado laboral y una mejor explicación de las capacidades y funcionamientos que genera el empleo (Sehnbruch, 2004).

Capítulo 2:
Objetivos, hipótesis y metodología

Capítulo 2. Objetivos, hipótesis y metodología

Teniendo en cuenta el marco teórico propuesto en la introducción, el objetivo general de esta tesis doctoral es analizar las desigualdades de género en el mercado de laboral atendiendo a la cantidad y a la calidad del empleo.

Además del objetivo general descrito, en este estudio se identifican cuatro objetivos específicos. En primer lugar, analizar la existencia de autocorrelación espacial en las tasas de empleo masculina y femenina y en la brecha de género en el empleo en las regiones objeto de estudio. En segundo lugar, analizar la presencia de interacción espacial entre las regiones vecinas y su influencia en el aumento de los niveles de empleo y en la reducción de la brecha. En tercer lugar, identificar los factores laborales y socioeconómicos que influyen en un aumento de niveles de empleo y en una reducción de la brecha de género. Por último, en cuarto lugar, analizar el impacto de la calidad del empleo y de la vivienda sobre el desarrollo humano.

Para cumplir con el primer objetivo, se presentan mapas de coropletas que muestran la distribución espacial de las variables estudiadas y se realizan las pruebas de la I de Moran y el test Joint Count que examinan la existencia de autocorrelación espacial en la brecha de género en el empleo y en logro de la meta del empleo propuesto por la estrategia europea *Europa2020*. Para cumplir con el segundo objetivo se utilizan modelos econométricos espaciales que permiten cuantificar la presencia de interacciones espaciales en la brecha de género en el empleo en 727 municipios andaluces para el período 2012-2016 y en la probabilidad de alcanzar el objetivo *Europa2020* para el caso femenino y masculino en 270 regiones europeas en el año 2017. Además, estos modelos econométricos permiten identificar el impacto de ciertos factores socioeconómicos y laborales sobre los fenómenos analizados. Para cumplir con el cuarto objetivo se estima

un modelo de datos de panel en 28 países de la Unión Europea para el período 2006-2018 que permite contrastar la relación negativa entre el trabajo a tiempo parcial involuntario y el índice de desarrollo humano.

Así, en este estudio se plantean las siguientes hipótesis:

Hipótesis 1 (H1): La distribución espacial de la brecha de género empleo en los municipios andaluces y de las regiones europeas que cumplen la estrategia *Europa2020* en los objetivos de empleo femenino y masculino no es aleatoria, sino que está formada por conglomerados espaciales

Hipótesis 2 (H2): La brecha de género en el empleo en un municipio y la probabilidad de que una región cumpla los objetivos de empleo femenino y masculino de *Europa2020* están influenciadas por lo que ocurre en las regiones vecinas.

Hipótesis 3 (H3): Determinados factores laborales y socioeconómicos influyen en una reducción de la brecha de género en el empleo y en la probabilidad de que las regiones cumplan los objetivos de empleo masculino y femenino *de Europa2020*.

Hipótesis 4 (H4): La calidad en el empleo, medida a través del trabajo a tiempo parcial involuntario, restringe la expansión de las capacidades humanas para que las personas puedan llevar la vida que desean, es decir, tiene un impacto negativo sobre el desarrollo humano.

Por lo que respecta a la metodología[1], en función de los objetivos y las hipótesis planteadas en nuestro estudio, se adoptan las técnicas de econometría espacial para llevar a cabo el análisis empírico de la investigación.

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[1] Para un análisis más exhaustivo de la metodología utilizada en esta investigación pueden acudir a la sección de resultados de cada una de los trabajos científicos presentados correspondientes a los Capítulos 3, 4 y 5 de la tesis doctoral.

La econometría clásica considera a las regiones como entidades independientes, de forma que no toma en cuenta las interacciones espaciales que pueden ocurrir entre las regiones que pertenecen a una misma área geográfica (Anselin, 1988). Sin embargo, las técnicas econométricas espaciales permiten considerar los denominados efectos espaciales entre las regiones, es decir, cómo es la distribución y el comportamiento de las variables analizadas a través del espacio geográfico. Esta técnica comenzó a aplicarse a inicios de los años 70 en el ámbito de las ciencias sociales, en escenarios como el urbanismo y la geografía económica (Siabato y Guzmán Manrique, 2019). Esta disciplina se apoya en la la primera ley de la geografía de Waldo Tobler que establece que todo está relacionado con todo lo demás, pero las cosas cercanas en el espacio están más relacionadas que las distantes (Tobler, 1970). En este sentido, la contribución de Tobler hace referencia al concepto de autocorrelación espacial que mide el grado de asociación espacial de una variable que se distribuye en un espacio geográfico (Fischer y Griffith, 2008).

Por tanto, obviar el contexto espacial significa una perdida importante de información ya que, los datos generalmente presentan algún tipo de dependencia o autocorrelación espacial, es decir, que puede existir una relación entre lo que ocurre en un punto del espacio y lo que sucede en otro lugar. Una de las formas de considerar los elementos espaciales es a través de matrices de pesos espaciales, definida como W, la cuál considera las coordenadas de localización geográfica de las variables y representa la estructural espacial de los datos (Anselin, 1988). En la literatura existente se pueden encontrar diversas matrices de pesos, así, entre las más usuales, se encuentran la matriz de vecindad por contiguidad, la matriz de vecindad por distancia o la matriz de vecindad por inversa de la distancia (Moreno y Vayá, 2000). En función del análisis que realicemos es más idóneo emplear una u otra matriz, es decir, considerar si dos unidades espaciales

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tienen una frontera común para el caso de vecindad por contiguidad o, por el contrario, tener en cuenta la distancia entre las unidades territoriales.

En cuanto a la autocorrelación espacial de una variable, esta se puede observar a través de mapas de coropletas que muestren la posible existencia de conglomerados espaciales (Anselin, 1988), es decir, si existe un determinado patrón espacial de concentración. Los mapas nos permiten examinar de forma descriptiva la distribución espacial de la variable entre las regiones objeto de estudio y pueden ser un indicador clave de la posible existencia de autocorrelación espacial. Sin embargo, para probar empíricamente la presencia de autocorrelación espacial de una variable de interés de forma univariante se utilizan la prueba de la I de Moran (Anselin, 1988; Nicolini y Resmini, 2011) o la prueba de conteo Jtot Joint Count (Cliff y Ord, 1981) entre otras. El Índice de Moran, uno de los más conocidos y extendidos, está fundamentado en los trabajos de Moran (1948) y Krishna Iyer (1949), y fue potenciado posteriormente por Geary (1954). Se trata de un estadístico que mide la autocorrelación espacial cuando se trata de variables continuas. En cuanto al test Jtot Joint Count fue desarrollado por Sokal (1979), Cliff y Ord (1981) y Griffith (1987) y es un estadístico que mide la autocorrelación espacial en el caso de la variable binarias (0=ausencia, 1=presencia).

Por otro parte, para examinar el efecto espacial entre una variable explicada en relación a otras variables explicativas se realizan modelos econométricos espaciales (Anselin, 1988; Elhorst, 2014). Los modelos de datos de panel permiten cuantificar la relación entre una variable dependiente con sus respectivas variables explicativas, pero no controlan las interacciones espaciales que puedan producirse (Elhorst, 2014). Por ello, una vez que determinamos qué modelo de regresión clásico se ajusta mejor a la estructura de nuestros datos, es decir, si nuestros datos se ajustan mejor a un modelo pooled, un

modelo de efectos fijos (FE) o un modelo de efectos aleatorios (RE), se estima un modelo econométrico espacial.

Según Elhorst (2012) existe una gran variedad de modelos cuando se trabaja con paneles de datos espaciales, aunque se puede partir de un modelo General Nesting Spatial Model. En el caso de datos de panel puede especificarse de la siguiente manera:

$$yt = \rho Wyt + iN\alpha t + Xt\beta + WXt\theta + \mu + ut$$

$$ut = \lambda Wut + \varepsilon t, \text{t} = 1, \ldots, \text{T}.$$

Donde W es una matriz cuya interaccion (i, j) -ésimo elemento tiene algún valor finito y positivo no estocásticos, si la región i y j interactúan y 0 en caso contrario. El parámetro ρ representa el parámetro autorregresivo espacial. Wyt recoge la presencia de los efectos secundarios, θ es el coeficiente del espacial de los regresores exógenos (WXt) y, λ es el coeficiente de autocorrelación espacial de Wut (Elhorst, 2014).

A partir de este modelo en general, se pueden obtener diferentes especificaciones tales como: un modelo Autorregresivo Espacial (SAR: "Spatial Auto Regressive), un modelo de Error Espacial (SEM: "Spatial Error Model") o un modelo Espacial de Durbin (SDM: "Spatial Durbin Model") entre otros. En esta línea, cuando λ = 0 estamos ante un modelo SAR; cuando δ = 0 y θ = 0 estamos ante un modelo Spatial Error Model (SEM) y cuando λ = 0, estamos ante un modelo espacial durbin model (SDM) La especificación finalmente elegida será aquella que se ajusta mejor a la estructura de los datos de nuestra investigación. (Zafra-Gómez, Chica-Olmo y Garrido, 2017).

En línea con la metodología descrita, un territorio debe entenderse como un espacio geográfico particular donde existen una serie de características laborales, sociales y económicas que condicionan la naturaleza del mercado de trabajo que ahí se desarrolla

(Rainnie, Herod and McGrath-Champ, 2011). De esta forma, aplicar el análisis espacial al estudio de las relaciones laborales y otros aspectos socioeconómicos permite indagar en cómo una determinada distribución geográfica condiciona o influye en estos fenómenos (Sánchez-Peña, 2012). En este sentido, existen algunos estudios que han evidenciado que la distribución espacial del empleo masculino y femenino en un territorio no se produce de forma aleatoria, sino que existen interacciones espaciales entre las regiones como consecuencia de determinadas características regionales (Elhorst y Zeilstra, 2007; Hudson, 2001; Rainnie et al., 2011).

Además de estas características comunes, las interacciones espaciales que se producen en el nivel de empleo masculino y femenino pueden deberse también a la existencia de difusión de políticas entre las regiones, es decir, cuando las políticas públicas adoptadas por un gobierno regional influyen en las políticas públicas adoptadas por los gobiernos vecinos (Gilardi, 2010; Simmons y Elkins, 2004; Chica-Olmo, Checa-Olivas, López-Castellano, 2021). La difusión de políticas se produce a través de una serie de mecanismos, como la coerción, la imitación, la competencia y el aprendizaje (Simmons, Dobbin y Garrett, 2006). Dicha difusión de políticas puede conducir al surgimiento de autocorrelación espacial y de agrupamiento espacial entre regiones, de modo que un aumento en el nivel de empleo en una región *i* influye en el nivel de empleo de las regiones vecinas (Niebuhr, 2003). Según Shipan y Volden (2008) esto fenómeno puede deberse a un mecanismo de imitación, que ocurre cuando las decisiones tomadas por las administraciones regionales imitan las de otras regiones, independientemente de que las decisiones sean o no efectivas. Otro mecanismo que puede conducir a la autocorrelación espacial es la competencia económica, que ocurre cuando las administraciones regionales compiten por adoptar determinadas políticas debido a los resultados de las políticas implementadas por otras regiones (Chica-Olmo y Checa-

Olivas, 2021). Así, el impacto económico de la adopción de políticas activas de empleo con el fin de reducir la brecha puede servir de referencia para regiones de una misma área geográfica (Ruiz-Villaverde, Chica-Olmo, González-Gómez, 2018). Finalmente, en línea con Berry y Baybeck (2005), el mecanismo de aprendizaje se refiere al proceso por el cual una región adopta decisiones implementadas en otras regiones una vez que se ha demostrado que dichas decisiones son exitosas. Por lo tanto, la reducción en una región de la brecha de género en el empleo a través de una determinada política pública puede conducir a un efecto de contagio entre las regiones, esto es que las regiones vecines adopten la misma política para hacer reducir también su brecha (Overman y Puga, 2002).

En definitiva, las interacciones espaciales pueden ser fruto de fuerzas económicas, sociales o políticas que tienden a agrupar poblaciones con rasgos compartidos en ciertas áreas (Voss, Long, Hammer y Friedman., 2006) y, además, consecuencia directa de los mecanismos de difusión de políticas. Por tanto, considerar la presencia de interacción espacial en el análisis nos permite trazar una imagen más completa de cómo los lugares y sus atributos se interrelacionan entre sí (Haining, 2003) y nos aporta información muy valiosa sobre el comportamiento de los patrones de empleo en las regiones objeto de estudio. Para ello se adopta la econometría espacial ya que estas ténicas permmiten considerar los efectos espaciales entre las regiones, es decir, las interacciones espaciales que se producen entre las variables objeto de estudio.

Capítulo 3:
Regional characteristics
of the gender employment gap:
A spatio-temporal approach

Regional characteristics of the gender employment gap: A spatio-temporal approach

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Abstract

There is a substantial body of research that recognises the importance of analysing regional characteristics in employment and labour relations that occur in a given geographical context. However, this phenomenon has been scarcely studied from a spatial approach. This article uses a spatio-temporal panel data model to examine the spatial interactions between the gender employment gap and, some labour and socioeconomic characteristics of 727 municipalities of Andalusia, Spain, for the period 2012–2016. The results show that due to spatial diffusion mechanisms, a spatial spillover effect occurs in both the gender gap in employment and in some of the labour and socioeconomic characteristics considered. These findings may be extended to other geographic areas and can be of use for the implementation of regional policies aimed at narrowing the gender employment gap.

JEL Codes: R10, J16, E24

Keywords: Employment, gender gap, labour market, policy diffusion, spatial mode

3.1. Introduction

Numerous studies have shown that the spatial distribution of male and female employment is not purely random, but rather they show spatial interaction (Elhorst and Zeilstra, 2007; McGrath-Champ et al., 2010; Hudson, 2001; Rainnie et al., 2011). These investigations highlight that the geographical context is not simply a geographical area formed. by regions in which there is a set of common characteristics that affect the labour

market, but that there is also spatial interaction between these regions (Rainnie et al., 2011). Having estimates of these interactions would be of interest not only to scholars, but also to policymakers who seek to mitigate the problems arising from the labour gap. However, these interactions are not always easy to observe. For this reason, this work tries to quantify these spatial interactions with the help of spatial econometric methods. These methods allow estimating to what extent a region's employment gap may be affected not only by its own labour and socioeconomic factors, but also by the employment gap and labour and socioeconomic factors of neighbouring regions. The results shown in this work corrrespond to the region of Andalusia, Spain, but these spatial interactions can occur in other geographic areas (countries, states, etc.), regardless of whether they may have their own particular characteristics (Hudson, 2001). In this line, much of the literature has identified the main labour and socioeconomic characteristics of regions that influence women's and men's labour market participation (Bettio et al., 2013; Castellano and Rocca, 2019; Olivetti and Petrongolo, 2014; Noback et al., 2013).

This phenomenon has been scarcely studied from a spatial approach and even less so from a spatio-temporal approach. Classical econometrics does not take into account spatial interactions that can occur between regions belonging to the same geographical area, since they are considered isolated entities (Anselin, 1988). However, in line with Tobler's law (1970) – which establishes that everything is related to everything else, but what is close is more related than what is distant – some studies have shown the existence of a series of diffusion mechanisms in adopting local and regional policies through which regions close to others make similar decisions (Shipan and Volden, 2008). This can cause a spatial spillover effect in employment levels between neighbouring regions. Other works have also highlighted the importance of introducing spatial interactions between

the regions of a geographic area to capture the effect that common regional characteristics can have on the presence of a spillover effect (Haining, 2003).

The classical regression model can be used to quantify direct effects, that is, to measure to what extent the labour gap in regions is affected by some labour or socioeconomic aspects of those regions, without considering what occurs with their neighbouring regions. In this article, we argue that to properly understand the gender employment gap in a geographic area, it is necessary to analyse not only the regional characteristics that explain this gap in those regions, but also those of their neighbours. This work studies the gender gap in 727 Andalusian municipalities (Spain) for the period 2012–2016 and sets out three main objectives. The first consists of determining whether the gender gap in employment is spatially distributed in a random way or not, and whether this behaviour persists over time. The second objective is to analyse whether endogenous spillovers, possibly due to spatial diffusion mechanisms, have occurred which cause the gender employment gap, in a given municipality, to be influenced by that of its neighbouring municipalities. The third objective is to identify which labour and socioeconomic characteristics affect the gender employment gap of the municipalities (direct effects) and of their neighbouring municipalities (indirect effects). To achieve the first objective, the presence of spatial autocorrelation in the gender employment gap has been analysed for each of the years considered, using a classical univariate method such as the Moran's I statistic. To achieve the second and third objectives, a multivariate method such as the regression model has been used; specifically, a spatial econometric model known as the spatial Durbin model (SDM) was estimated. The SDM uses spatio-temporal data and also identifies endogenous spillover, as well as direct and indirect effects.

This study is structured as follows. The theoretical foundation of our work and the hypotheses are presented in the following section. The data and variables used in the study are then presented, followed by a discussion of the results of the econometric models. Finally, conclusions are drawn.

3.2. Literature review and hypothesis

3.2.1. The geographic context and regional characteristics

Social, economic and political life is embedded in particular spatial structures (Herod et al., 2007). Places are constituted by and through factories, offices, landscapes and houses, and are a continuous mixture of meanings that are affected by shared social practices which construct a particular context (Hudson, 2001; McGrath-Champ et al., 2010). According to Hudson (2001), a territory, understood as a geographic context, shapes the employment and labour relations that occur within that territory. Therefore, geographic space is not understood simply as a spot on a map where things 'take place', but that there are a number of labour, social and economic features common to a territory that condition the nature of the employment and work that takes place in that particular context (Rainnie et al., 2011). For this reason, analyses of labour relations and other socioeconomic aspects within a geographic space are of interest since they inquire into how a given geographic distribution conditions or influences these phenomena (Sánchez-Peña, 2012).

In this vein, numerous studies have analysed regional-level labour and socioeconomic characteristics that may influence female and male labour force participation (Goodchild et al., 2000; McGrath-Champ et al., 2010). Some authors have examined job characteristics in a geographic area to determine labour market inequalities using factors related to the regional structure of employment opportunities, such as the

sectoral structure or labour supply and demand (Azmat et al., 2006; Castellano and Rocca, 2019; Goldin, 1995; Olivetti and Petrongolo, 2014). Other authors have analysed the sectoral structure of regions using industrial specialisation indices and indicators of the sectoral composition of activities (Bowen and Finegan, 1969; Elhorst and Zeilstra, 2007; Noback et al., 2013), or labour supply and demand in a given region based on unemployment rates (Elhorst, 1996; Euwals et al., 2007; Van der Veen and Evers, 1984; Van Ham and Büchel, 2006).

A considerable body of literature has also included factors related to regional socioeconomic characteristics to analyse the level of female and male employment in a territory (Cotter et al., 2001; Fitzenberger et al., 2004; Bettio et al., 2013; Cha, 2013). In this regard, some studies have shown the negative effect that the presence of dependents in the household has on female labour participation (Cukrowska-Torzewska, 2016; Moen and Yu, 2000) using the dependency ratio as one of the indicators (Abellán et al., 2011; Noback et al., 2013). In their analyses, Buzar et al. (2007) and Haase et al., (2009) included variables related to population structure, such as the percentage of young women or population density to determine labour market participation in a given región. Other studies have examined factors related to retirement pensions to measure gender inequalities in working life and the greater monetary poverty suffered by women in certain territories (Blackburn et al., 2016; Möhring, 2015; Vara, 2013; Zhao and Zhao, 2018). Finally, a part of the literature has also incorporated variables related to access to political power to analyse the employment gap between men and women in a territory (Arceneaux, 2001) or variables related to income or the economic dimension in reports on the gender gap (Hausmann et al., 2013).

Therefore, based on the literature review, we have selected a set of observable factors related to the employment and socioeconomic characteristics of regions, in order to

quantify the effects that these characteristics have on the gender employment gap, in a given geographic context.

3.2.2. The importance of spatial interaction

Classical econometrics considers regions as independent entities without taking into account the spatial interaction between them (Anselin, 1988), while, on the contrary, according to Tobler's law (1970) the presence of spatial autocorrelation or spatial interaction is expected (Anselin, 2001). Spatial autocorrelation refers to the correlation of georeferenced observations of a single variable measured at different locations, which can sometimes be due to spatial spillover (Fischer and Griffith, 2008). The spatial autocorrelation of a single variable can be analysed intuitively by observing the behaviour of the variable on a choropleth map that displays the spatial clusters and analytically by means of some statistical tests such as Moran's I test (Anselin, 1988). This test determines the degree of spatial autocorrelation of the variable of interest (Morton et al., 2018) in a univariate way, that is, without considering the effect of other variables. However, spatial econometrics models consider not only other observable explanatory variables, but also the spatial autocorrelation by including a spatially lagged dependent variable in the model (Morton et al., 2018). This variable controls for endogenous spillovers (Fageda and Olivieri, 2019) or the global spatial effect (Elhorst, 2014). In addition, it is also possible to take into account exogenous spillovers by including spatially lagged explanatory variables (Fageda and Olivieri, 2019). Normally, these spillover effects are not directly observable as they are difficult to measure and hence to quantify. However, spatial econometrics models permit obtaining the estimates of these effects.

Spatial interaction and endogenous spillovers in the gender employment gap may be due to the existence of policy diffusion between regions, that is, when public policies adopted by a regional government are influenced by the public policies of neighbouring

governments (Gilardi, 2010; Simmons and Elkins, 2004). Policy diffusion occurs through mechanisms of diffusion, such as coercion, imitation, competition and learning (Simmons et al., 2006). Policy diffusion can lead to the emergence of spatial autocorrelation and spatial clustering between regions, such that an increase in the employment level in a region i influences the employment level of neighbouring regions (Niebuhr, 2003). This may be due to an imitation mechanism, which occurs when decisions taken by regional administrations imitate those of other regions, regardless of whether, or not, the decisions are effective (Shipan and Volden, 2008). Another mechanism that can lead to spatial autocorrelation is economic competition. This occurs when regional administrations compete to adopt certain policies due to the outcomes of applying policies implemented by other regions. Thus, the economic impact of adopting active employment policies in order to reduce the gap can serve as a benchmark for regions in the same geographical area (Ruiz-Villaverde et al., 2018). Finally, the learning mechanism refers to the process by which a region adopts the decision of other regions once those decisions have been proven to be successful (Berry and Baybeck, 2005). Thus, if one region significantly decreases the gender employment gap, this may lead to a contagion effect, causing the gap in neighbouring regions to decrease as well (Overman and Puga, 2002).

In considering the presence of spatial interactions, it is possible to draw a more complete picture of how places and their attributes interrelate with each other (Haining, 2003). These spatial interactions may be the product of economic, social or political forces that tend to group populations with shared traits together in certain areas (Voss et al., 2006) or, as Manski (1993) explains, the presence of common factors and social networks affects neighbouring regions and causes the behaviour of the regions to be similar. In other words, these common regional characteristics, generated by geographic context, can lead to the presence of spatial autocorrelation. Therefore, in a geographic

context marked by specific labour and socioeconomic characteristics, it is necessary to incorporate the spatial analysis approach (Corrado and Fingleton, 2012).

Few investigations have examined spatial interaction in the labour market. For instance, Elhorst and Zeilstra (2007) showed that employment in a given region is influenced by that of neighbouring regions. This spatial behaviour has also been studied using cross-sectional data for the case of the gender employment gap in Dutch municipalities (Noback et al., 2013)

3.2.3. Hypotheses

In line with the above, our first hypothesis (H1) aims to identify the existence of spatial autocorrelation in the gender employment gap between the municipalities of Andalusia, without considering the effect of other variables, and whether this autocorrelation has persisted over time. The aim of our second hypothesis (H2) is to determine whether endogenous spillovers have occurred between the municipalities (H2). And, finally, we are interested in quantifying the direct and indirect effects of regional factors that influence this gap (H3). That is, we want to determine whether some of the characteristics related to the region's employment opportunity structure and certain socioeconomic characteristics not only explain the gender employment gap in a municipality (direct effects), but also affect the gap in neighbouring municipalities (indirect effects). To this end, we have formulated three hypotheses as follows:

Hypothesis 1 (H1). The spatial distribution of the gender employment gap in Andalusian municipalities is not random but formed by spatial clusters.

Hypothesis 2 (H2). The gender employment gap of municipalities tends to be affected by neighbouring municipalities.

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Hypothesis 3 (H3). Regional labour and socioeconomic characteristics affect the gender employment gap in a municipality (direct effects) and the gender employment gap in its neighbouring municipalities (indirect effects).

Figure 1. Study area.
Source: Own Elaboration.
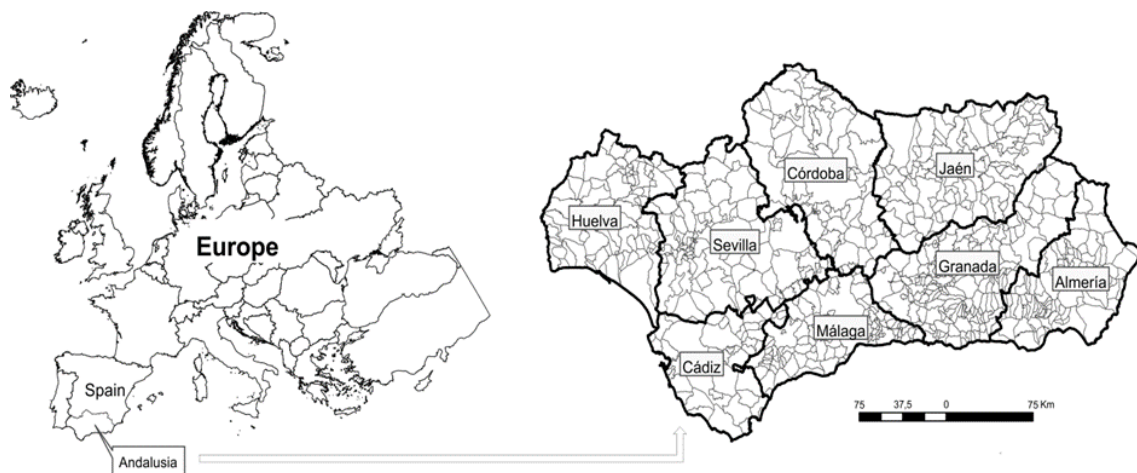
3.3. Study area, data and variables

The study area comprises the autonomous community of Andalusia, Spain, which is located in the most southwestern part of Europe (see Figure 1). Andalusia is the second largest region in the entire Iberian Peninsula, covering an area of 87,268 km². It is also the most populated region in Spain with 8,426,405 inhabitants, of whom 4,159,637 are men and 4,266,768 are women Instituto Nacional de Estadística (INE), 2019). The population of Andalusia accounts for nearly 2% of the total European Union (EU) population, exceeding the population of more than half of EU countries. Andalusia is made up of eight provinces (Almeria, Cadiz, Cordoba, Granada, Huelva, Jaen, Malaga and Seville) with a total of 786 municipalities (Junta de Andalucía, 2009). Several specific areas can be distinguished in Andalusia, each of which has its own labour and socioeconomic characteristics depending on the geographic context of the area.

The years selected for the analysis are 2012–2016, a period in which Spain began to leave behind the economic recession caused by the international financial crisis. This crisis strongly affected the region of Andalusia, but according to some studies it was also one of the regions that recovered most quickly (Reig, 2017).

Table 2 shows the variables used in the analysis and their sources of information. The dependent variable is the gender employment gap (*gender_gap*), defined as the percentage difference between the male employment rate and the female employment rate. The female and male employment rates have been calculated by dividing the number of women and men affiliated to the Spanish social security system by the total population of women and men aged 15–65years.

Two indicators have been used to examine the degree to which the structure of industrial activity in a region influences male and female labour participation: *mix* (Bowen and Finegan, 1969; Elhorst and Zeilstra, 2007) and *servicesector*. The variable *mix* predicts the expected proportion of female employment in a municipality according to the regional-level industrial specialisation, combined with the expected proportion of female employment in the region of Andalusia as a whole

$$Mix^{r,f} = 100 * \sum_{s=1}^{4} \frac{E_s^{r,m+f}}{E_{total}^{r,m+f}} * \frac{E^{n,f}}{E_s^{n,m+f}}$$

where *E* is employment, calculated as the number of social security affiliations; *s* is the sector, for which four sectors are calculated separately (agriculture, industry, construction and services); *m* denotes males; *f* denotes females; *r* is the municipality; and *n* is Andalusia.

Table 2. Descriptive estatistics and sources.

Statistic	Mean	St. Dev.	Min	Max	Descriptions and sources
Gendergap	0.210	0.071	-0.219	0.541	% Male employment rate − % female empl
Unemploywomen	0.140	0.036	0.034	0.241	No. of unemployed registered (women)/act
Unemploymen	0.218	0.076	0.035	0.503	No. of unemployed registered (men) / activ
Mix	45.420	3.347	18.864	53.255	$Mix^{r,f} = 100 * \sum_{s=1}^{4} \frac{E_s^{r,m+f}}{E_{total}^{r,m+f}} * \frac{E^{n,f}}{E_s^{n,m+f}}$ (IE
Servicesector	39.472	18.756	0.000	94.144	$IE_{i,j} = \frac{\frac{E_{i,j}}{\sum E_{i,k}}}{\frac{E_{h,j}}{\sum E_{h,k}}}$ (IECA)
Dependency_rate	0.535	0.090	0.241	1.154	No. of persons < 15 + No of persons > 65 / (IECA)
Youngwomen	0.140	0.036	0.034	0.241	No. women 15-30 years age / population to
Density	229.786	785.636	2.380	10,077.070	No. of inhabitants per km^2 (IECA)
Pensionwomen	0.584	0.079	0.433	1.079	Average amount of women´s pension (thou
Pensionmen	0.845	0.163	0.478	1.594	Average amount of men´s pension (thousar
Councilwomen	0.404	0.104	0.000	1.000	No. of councilwomen (PT)
Income	4.125	1.422	0.490	11.496	Average per capita (thousands of euros) (I

Source: Authors' calculations based on data generate from Instituto de Estadística y Cartografía de Andalucía (IECA), Servicio Pú de Transparencia de la Administración General del Estado (PT). Note*:* N = 3635.

The variable *servicesector* is calculated as the municipal percentage of employment in the service sector, that is, as an index of industrial specialization in the service sector:

$$IE_{i,j} = \frac{\dfrac{E_{i,j}}{\sum E_{i,k}}}{\dfrac{E_{h,j}}{\sum E_{h,k}}}$$

where *E* is employment and is calculated as the number of social security affiliations; *i* is the municipality; *j* is the sector, for which only the service sector is calculated; *k* is the total sectors (agriculture, industry, construction and services); and *h* is Andalusia.

In addition, in order to approximate the employment opportunities structure in Andalusia, two variables were used (Broersma and van Dijk, 2002; Van Ham and Büchel, 2006:): *unemploywomen*, which measures the number of registered unemployed women over the total active population of a municipality; and *unemploymen*, which reflects the number of registered unemployed men over the total active population of the same municipality.

To analyse the regional-level socioeconomic characteristics, several variables were used. As regards the presence of dependents (children and the elderly) in Andalusia, the indicator *dependency_rate* was used (Abellán et al., 2011; Noback et al., 2013). This variable is calculated as the sum of the number of persons under the age of 14 years and over the age of 65years divided by the number of persons aged 14–65years and multiplied by 100

$$Dependency\_rate = \frac{Number\ of\ persons < 14 + Number\ of\ persons > 65}{Number\ of\ persons\ 14 - 65\ years\ age} * 100$$

To measure the presence of young women and the population density in Andalusia, the variables *youngwomen* and *density* were used (Consejo Económico y Social, 2018; INE, 2019). *Youngwomen* is calculated as the percentage of women aged 15–30years over the total population of a given municipality. Density is calculated as the number of inhabitants per square kilometre of a territory (hab/km2). To measure gender inequalities in working life (Blackburn et al., 2016; Zhao and Zhao, 2018), the variables *pensionmen* and *pensionwomen* were used. These variables are defined as the mean retirement pension (in thousands of euros) for men and women. Other variables used to determine the socioeconomic aspects of municipalities included the number of political representatives (Arceneaux, 2001) by means of the indicator councilwomen, which is calculated as the number of *councilwomen* elected to each of the municipal (town or city) councils, and the indicator *income*, which is calculated as the mean income per inhabitant in thousands of euros.

Figure 2 shows the spatial distribution of the employment gap for the 5years considered. As can be observed in the figure, municipalities located close to each other are shown in a similar colour, thus indicating strong spatial clustering. More specifically, a certain grouping can be observed in the municipalities marked in dark grey (municipalities with high employment gap percentages) and in light grey (municipalities with low employment gap percentages). Municipalities with a greater employment gap are spatially concentrated in the north and interior of Andalusia, particularly in the northern areas of the provinces of Huelva, Seville and Cordoba and in the southwestern area of the province of Jaen. These are provinces with a particular geographic context and common socioeconomic and employment characteristics. Specifically, they are characterised by a low population density and a strongly masculinised primary sector dedicated to agricultural and livestock production with few employment opportunities for

women, who have left the area in search of work. This behaviour is also observed in southwest Almeria since horticultural production is predominant in the province and employs a considerable amount of male labour (Figure 2).

Figure 2. Sptaial distribution of gender employment gap in Andalusia
Source: Own Elaboration based on data from Instituto de Estadístiva y Cartografía de Andalucía (IECA).
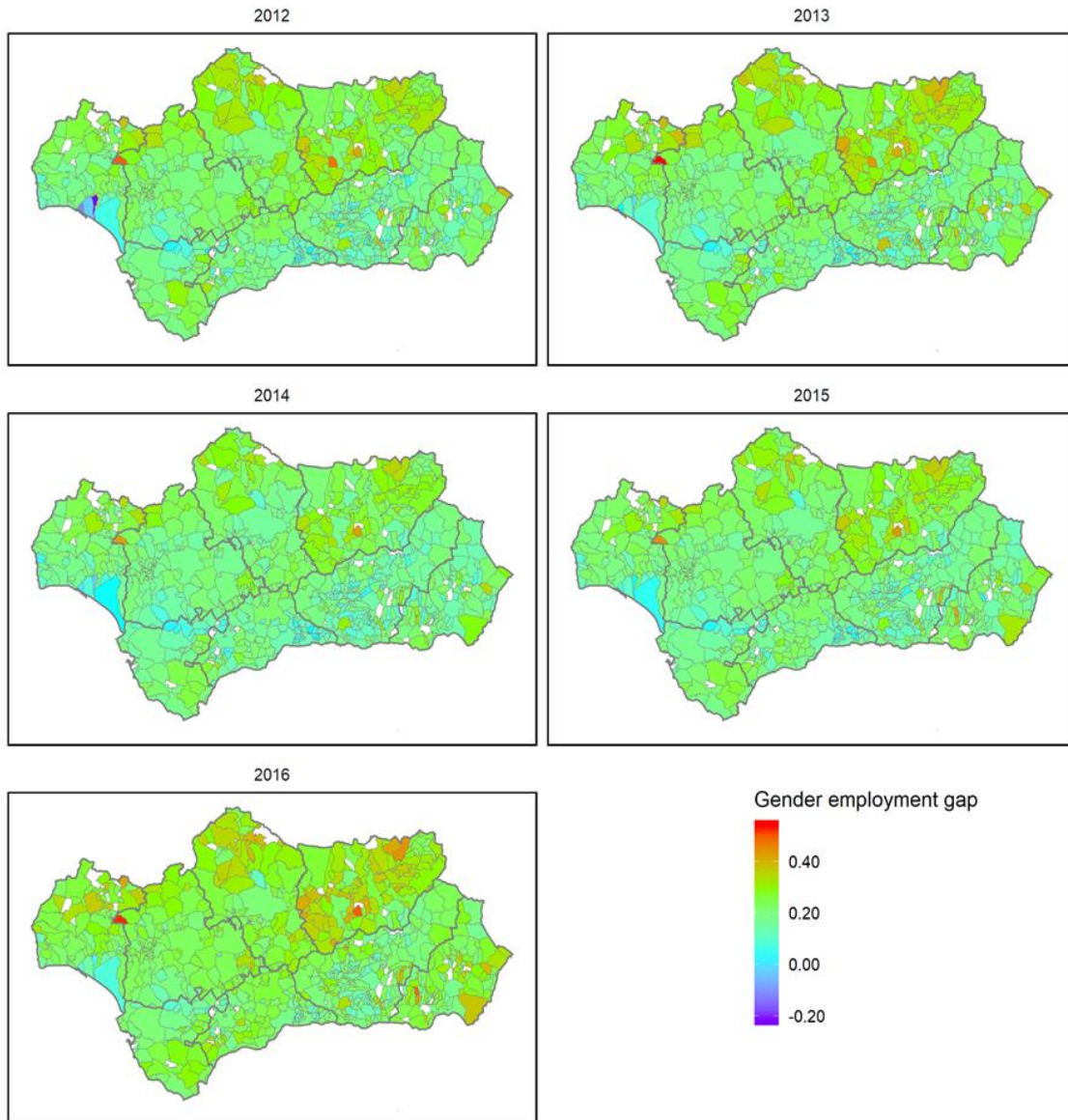
In contrast, there are spatial concentrations with low gender employment gap values in the south of the province of Huelva and in the province of Malaga and some coastal municipalities, as well as in the provincial capitals and their metropolitan areas. These two geographic areas also display particular characteristics. In the province of Huelva,

strawberry production is the predominant activity and employs mainly female labour. In the province of Malaga, its capital and coastal municipalities and their metropolitan areas are characterised by an industrial and service activity that generates significant female employment. These areas also have a high percentage of young women.

It should be noted that the spatial concentration described above has generally remained unchanged over time (see Figure 2) because the socioeconomic characteristics and specific features of these Andalusian provinces persisted during the period analysed (Federación Andaluza de Municipios y Provincias, 2018). However, the gender employment gap widened each year over the period 2012–2016. This behaviour can be explained by the impact of the international economic crisis on male employment, which fell much more sharply than female employment. Nonetheless, following the economic recovery, male employment bounced back much more quickly than female employment, which became much more precarious (Gálvez-Muñoz and Rodríguez-Modroño, 2013).

3.4. Results

3.4.1. Spatial global autocorrelation

To test for the presence of global spatial autocorrelation, Moran's I test is used (Anselin, 1988; Nicolini and Resmini, 2011). This test detects the presence of spatial global autocorrelation, that is, if the gender gap in employment is distributed spatially at random or if, on the contrary, it presents spatial autocorrelation. The statistic to perform Moran's I test is given as:

$$I = \frac{n}{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}} \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}(y_i - \bar{y})(y_j - \bar{y})}{\sum_{i=1}^{n}(y_i - \bar{y})^2}$$

Where y_i is the observation of the gender employment gap in municipality i, $\overline{y}$ is its mean, and w_{ij} are the spatial weights corresponding to municipalities i and j.

Depending on the type of contiguity between municipalities, there exist different specifications for the weights w_{ij}. Following Anselin (1988, 2002), two of the most common specifications are the queen method and the distance between the centroids of the municipalities. In the case of the queen specification, the weights take a value of one if the municipalities share a common edge or vertex and zero otherwise. However, the weights of the second approach are obtained as the inverse of the distance between the centroids. The second criterion is in agreement with Tobler's principle that regions closest in space are more similar than distant ones. We have chosen the latter approach based on this principle.

Figure 3. Spatial autocorrelation (Moran's I) for each year.
Source: Own Elaboration based on data from Instituto de Estadística y Cartografía de Andalucía (IECA)
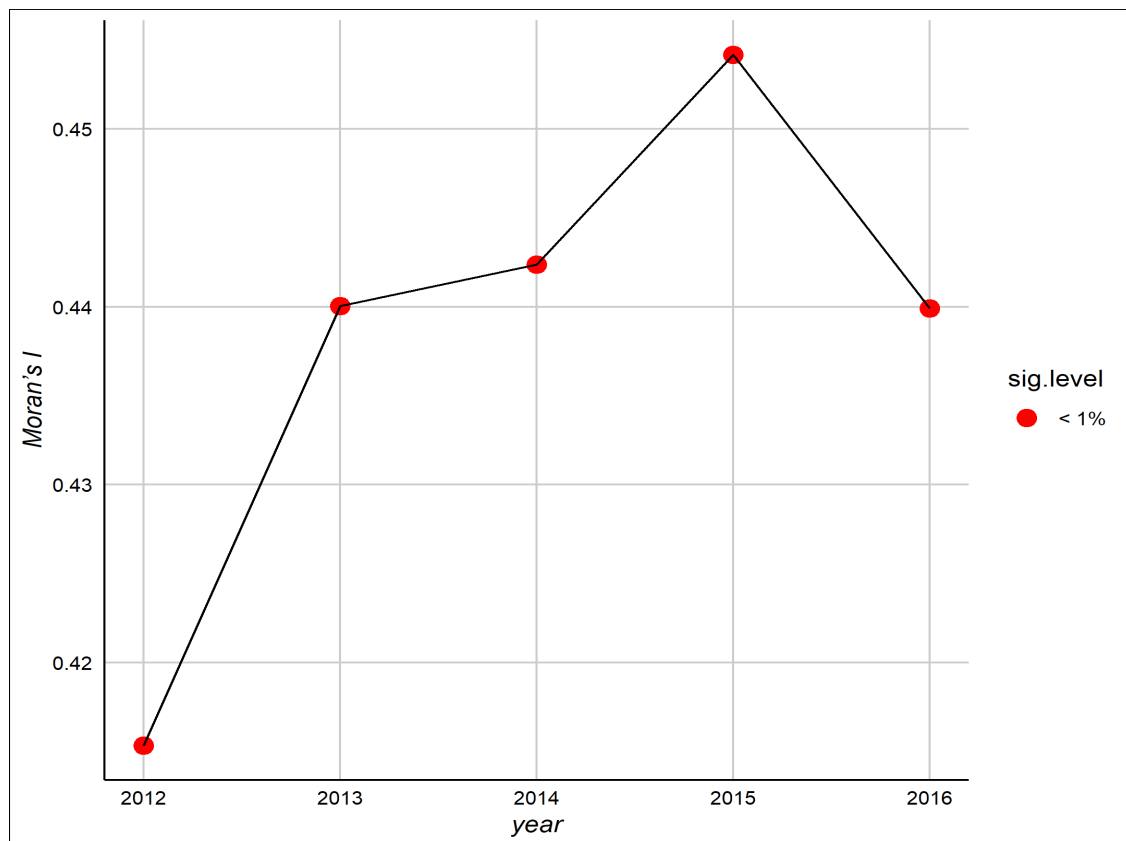
Figure 3 shows the values of Moran's I statistic for each year of the period considered. As can be observed, Moran's I is positive and statistically significant for all the years. The results confirm what was previously observed in Figure 2, that is, the municipalities of Andalusia display a high degree of spatial clustering over the 5-year period. That is, municipalities in close proximity to each other, have similar employment gap values. These results confirm H1 of our study, namely that the spatial distribution of the gender employment gap in Andalusian municipalities is not random, but formed by spatial clusters.

3.4.2. Models

In order to test H2 and H3, we estimated a spatial panel model. To this end, we first determined whether a pooled model, a fixed-effects (FE) model or a random-effects (RE) model was more suitable. The results of the Chow test (F=15.912, p<0.000) indicated that an FE specification was more suitable than a pooled specification. In addition, the results of the Breusch–Pagan test (χ^2=2707.4, p df = 1, $p < 0.000$) indicate that a RE model is preferable to a pooled model. Finally, the results of the Hausman test (Baltagi 2005; Elhorst 2009) indicate that a FE model is preferable to a RE model (chisq = 1165.6, df = 11, $p < 0.000$). Hence, the FE model is the chosen specification.

After performing the various tests to determine whether a pooled, FE, or RE model is the most suitable, we determined the spatial panel data structure. There is growing consensus in the economic literature that traditional econometric tools produce considerable bias by not controlling for the spatial spillover effect among regional data (LeSage and Pace, 2009). Hence, we consider a spatial panel data model. There are different spatial panel data specifications. One of the most general (Elhorst 2014; Mutl and Pfaffermayr 2011) is:

$$y_{it} = \phi + \rho \sum_{j=1}^{N} w_{ij} y_{it} + \mathbf{x}_{it}\beta + \sum_{j=1}^{N} w_{ij}\mathbf{x}_{ijt}\theta + u_{it}$$

$$u_{it} = \lambda \sum_{j=1}^{N} w_{ij} u_{it} + \varepsilon_{it}$$

Where y_{it} is the dependent variable *(gender_gap)* for municipality i (i = 1…727) in period t (t = 1 … 5); ϕ is the constant parameter; ρ is the parameter representing spillover effect; $\sum_{j=1}^{N} w_{ij} y_{it}$ denotes the spatial interactions in the gender employment gap among neighboring municipalities; w_{ij} are the spatial weights; $\mathbf{x}_{it}$ is a vector with 1xk explanatory variables; $\sum_{j=1}^{N} w_{ij}\mathbf{x}_{ijt}$ are the spatial interactions of the explanatory variables; β and θ are the associated vectors (kx1) of the parameters; λ is the spatial autocorrelation in the disturbances; and ε_{it} is the error iid.

When $\rho = 0; \lambda = 0$ and $\theta = 0$, the model is a classic non-spatial model; when $\rho \neq 0; \lambda = 0$ and $\theta = 0$, the model is a spatial autoregressive (SAR) or spatial lag model; when $\rho = 0; \lambda \neq 0$ and $\theta = 0$, the model is a spatial error model (SEM); and when $\rho \neq 0; \lambda \neq 0$ and $\theta \neq 0$, the model is called a spatial Durbin model (SDM).

The interpretation of parameter estimates in spatial models can lead to erroneous conclusions. LeSage and Pace (2009) developed a method to address this problem by calculating direct and indirect effects based on the coefficients obtained. Some studies have suggested that the analysis of direct, indirect, and total effects is a suitable form of interpretation in spatial analyses (Elhorst 2010; Stojčić, Aralica, and Anić, 2019; Zafra and Chica, 2019). The SDM not only captures the spatial spillover effect caused by the employment gap, and represented by the coefficient ρ, but also the spatial spillover effect of the explanatory variables represented by the indirect effects (Gong, Boelhouwer, and de Haan, 2014).

To determine the presence of spatial autocorrelation in the disturbances in both the pooled and FE models, Lagrange multiplier (LM) tests were performed, specifically the LM-lag and LM-error tests. Table 3 shows the results of the tests, which indicate a strong presence of autocorrelation in the disturbances as they are highly significant. Moreover, in order to determine which spatial specification best suits our data, we used the robust versions of the two previous tests (see Table 3) (Anselin and Rey 1991; Elhorst, 2010). Given that both statistics are significant, as in Anselin and Rey (1991), we chose the specification with the highest statistic value, which was SAR rather than SEM in our case.

We also performed the likelihood ratio (LR) test to determine whether a SAR model is more appropriate than a SDM. A significant difference was observed between the two models (SDM and SAR), so the SDM was finally chosen as the econometric specification (LR test for SAR/SDM =176.7856, p = 0.000).

The estimated models are shown in Table 3. As can be seen in the table, the SDM model had the smallest Akaike information criterion (AIC), thus indicating that this model is the most suitable econometric specification. It can also be observed that the coefficients of the key variables of our analysis are highly significant in all the models. Both results indicate the robustness of the selected econometric model.

The SDM captures not only the spatial endogenous spillover effect caused by the employment gap, but also the spatial spillover effect of the explanatory variables (Gong, Boelhouwer, and de Haan, 2014). Table 3 shows that the SDM coefficients of the key variables (*unemploymen, mix, servicesector, dependency_rate and youngwomen*) of our analysis are significant. Moreover, the coefficient of Wy (W*gender gap) is positive and significant. This indicates that the gender employment gap of municipalities tends to be affected by their neighbouring municipalities after accounting for the other explanatory variables, thus fulfilling H2. This endogenous spillover effect is likely due to the spatial

diffusion mechanisms described in the literature review, namely that decisions taken by regional administrations to reduce the gender employment gap are affected by decisions taken by administrations in neighbouring regions.

Table 3. Estimated regression models for gender gap employment.

Dep. variable	FE individual	SDM
Intercept	-	-
Unemploywomen	0.1001***	0.1120***
Unemploymen	−0.5356***	−0.5673***
Mix	−0.0005***	−0.0003*
Servicesector	−0.0001***	−0.0001
Dependency_rate	0.4016***	0.2656***
Youngwomen	−0.3820***	−0.1513***
Density	−0.0899***	−0.0472*
Pensionwomen	−0.0328*	−0.0428**
Pensionmen	0.0231	−0.0184
Income	0.0080***	0.0013
Councilwomen	0.0125	0.0117
Wx	-	*Included*
Wy (W*gender gap)	-	0.2899***
AIC	−18694.48	−19097.44
R^2	0.9321	0.9416
LM-lag	332.5201***	-
LM-error	211.9534***	-
Robust LM-lag	122.3604***	-
Robust LM-error	1.7938***	**-**

Source: Authors' calculations.
FE: fixed effects; SDM: spatial Durbin model; LM: Lagrange multiplier; AIC: Akaike information criterion. *Statistically significant at the $p < 0.10$ level; **statistically significant at the $p < 0.05$ level; and ***statistically significant at the p the $p < 0.01$ level.

Classically, the coefficients of panel models only consider direct effects but not spillover effect or indirect effects. In order to test H3, we follow the analyses of Elhorst (2010) and LeSage and Pace (2009), which consider the direct, indirect and total effects. The direct effects capture the impact of the change in the explanatory variables on the dependent variable, in a given municipality, while the indirect effects capture the impact of the change in the explanatory variables on the dependent variable in the neighbouring

municipalities. These impacts are the result of spatial feedback (LeSage and Pace, 2009). The sum of the two effects indicates the total effect of a change in the dependent variable. Table 4 shows the estimates of the three types of effects described. Therefore, to test H3 we look at the direct effects of the variables *unemploywomen, unemploymen, mix, dependency_rate, youngwomen* and *pensionwomen*, all of which capture factors related to the employment opportunity structure and certain socioeconomic characteristics of a municipality that affect the gender employment gap in that municipality. As can be observed in the table, the indirect effects of the variables *unemploymen, mix, servicesector, dependency_rate, youngwomen, pensionmen* and *income* are significant. This indicates that factors related to a municipality's labour and socioeconomic characteristics also affect the gender employment gap in neighbouring municipalities

To interpret the results of Table 4, we have selected the variable dependency_rate. This variable has a direct positive and significant effect on the gender employment gap. This finding indicates that municipalities with a high proportion of underage children and elderly individuals have a higher percentage of gender gaps. Thus, if the variable dependency_rate increases by 1% in a municipality, the gender employment gap will increase by 0.27% in that municipality. Moreover, the indirect effect is also positive and significant, indicating that if the variable dependency_rate increases by 1% in one municipality, the gender employment gap in neighbouring municipalities will increase by 0.12%. As indicated above, the indirect effect represents the spatial spillover effect of the explanatory variables (Gong et al., 2014). Hence, it can be concluded that this vari able shows significant spatial spillover. The sum of the two effects (direct and indirect) indicates that if the proportion of underage children and the elderly increases by 1%, the total effect on the gender gap will be an increase of 0.39%. The results obtained for the rest of the significant variables are the expected ones in line with the literature review

(Manski, 1993; Voss et al., 2006). The importance of distinguishing between direct and indirect effects is evidenced by the spatial spillover effects of certain explanatory variables (indirect effects) which, in our case, highlight the need to account for certain regional characteristics when analysing the gender employment gap

Table 4. Direct, indirect, and total effects

	Direct	Indirect	Total
Unemploywomen	0.1118***	-0.0020	0.1098***
Unemploymen	-0.5620***	0.0961*	-0.4658***
Mix	-0.0004**	-0.0025***	-0.0029***
Servicesector	-0.0001	-0.0003***	-0.0004***
Dependency_rate	0.2721***	0.1166***	0.3886 ***
Youngwomen	-0.1681***	-0.3364***	-0.5045***
Density	-0.0520	-0.1074	-0.1594
Pensionwomen	-0.0436**	0.0108	-0.0328
Pensionmen	-0.0109	0.1598***	0.1488***
Income	0.0021	0.0140***	0.0160 ***
Councilwomen	0.0108	-0.0148	-0.0040

Source: Author's calculations. Note: Statistically significant at the $p < 0.10$ level; **statistically significant at the $p < 0.05$ level; and ***statistically significant at the $p < 0.01$ level.

3.5. Conclusions and discussion

Spatial interaction has been scarcely addressed in the literature on the gender employment gap and the regional characteristics that influence it. This article has examined spatial interaction in the gender employment gap due to endogenous and exogenous spillovers. These spillovers can be caused by diffusion mechanisms and the labour and socioeconomic characteristics found within a given geographic context.

However, these spatial interactions can occur in other contexts and geographic areas, thus lending a general character to the results obtained.

Three hypotheses were formulated and tested in the results section. First, it was shown that the gender employment gap in Andalusia is distributed in spatial clusters and that this distribution has persisted over time (H-1). These results are in line with the literature which highlights that labour relations are not randomly spatially distributed, but that there are spatial interactions which cause municipalities nearby in space to have similar employment levels (Hudson, 2001; McGrath-Champ et al., 2010), which can sometimes be due to spatial spillover (Fischer and Griffith, 2008) and policy diffusion processes.

The existence of an endogenous spatial spillover effect on the gender employment gap between municipalities was also analysed (H2). This spatial interaction can be caused by policy diffusion mechanisms. According to Ruiz-Villaverde et al. (2018), when adopting certain policies, regional governments are not geographically isolated. Therefore, these results might confirm that the adoption of an employment policy in one region of Andalusia could have a significant influence on neighbouring regions due to mechanisms of imitation, competition and learning (Shipan and Volden, 2008). In other words, if a measure is promoted to reduce the gap in one municipality in Andalusia, the measure will not only influence that municipality, but its neighbouring municipalities as well.

The findings reveal that certain factors related to the labour and socioeconomic characteristics of a region exert an effect on the gender employment gap in a municipality and its neighbouring municipalities (H3). This information is important in order to guide public policy efforts towards factors that affect the employment gap in a municipality (direct effect). Specifically, these factors are male and female unemployment rates (which

highlight the discouraged worker and added worker effects) and a sectoral composition that is favourable to women, both of which are related to regional labour characteristics, as well as the dependency rate, the percentage of young females in the population and women's pensions, which are related to the socioeconomic characteristics of a municipality.

H3 also provides information about which factors policymakers should take into consideration to reduce the gender gap in neighbouring municipalities (indirect effect). Thus, for example, if a measure is implemented in a municipality to promote an industrial mix favourable to women, the measure will reduce the gap both in that municipality and in its neighbouring municipalities due to a spillover effect. This result is in line with Voss et al., (2006) and Manski (1993), who indicated that due to the presence of common factors and social networks, regions tend to behave in a similar manner to their neighbouring regions, hence the importance of incorporating spatial analysis in the study of gender employment.

By taking into account the presence of spatial interactions in the gender employment gap, we were able to obtain a more complete picture of how territories and their characteristics are interrelated. In this sense, our study provides information on the spatial patterns of the employment gap in Andalusia caused by both observable and unobservable factors. These unobservable factors, the spillover effect, can be determined by diffusion mechanisms, which are difficult to measure. Both types of factors will be present in other geographic areas, although the observable factors present their own specific characteristics.

In this regard, our study provides information on employment gap patterns in Andalusia according to the region's characteristics and spatial interactions. This information can be of use for implementing public policies to reduce gender inequalities

in the labour market, not only in the area analysed, but in other geographic areas as well. To conclude, the strategic decisions that public institutions must make in order to successfully address the gender employment gap can be supported by the analysis presented in this study. However, the regional scale (municipalities of Andalusia) of the analysis limits the scope of this work to a certain extent since it precludes collecting data on variables that could provide more information, such as level of training, time use or salary levels, among others.

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Capítulo 4:
Spatial impact of factors influencing the achievement of the Europa2020 employment targets

Spatial impact of factors influencing the achievement of the Europa2020 employment targets

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Abstrac

In this paper, autologistic models are used to examine the impact of certain factors on the likelihood of European regions' ability to meet the employment target for both men and women for the year 2017 in 270 EU regions at NUTS 2 level. The results show the role of both regional and gender differences in forming spatial clusters, as well as the presence of spatial interaction in achievement of the target. Moreover, meeting the European strategy's education target and increasing a region's GDP levels also have a positive impact on achieving the targets. These findings may be of interest for the implementation of socio-economic policies at a regional level, aimed at raising the employment rate for men and women in European regions.

JEL Codes: J01, J08, R12, C21

Keywords: autologistic model, employment, Europa2020 target, genderdisparities, spatial interaction

4.1. Introduction

In March 2010, after the Lisbon Agenda failure, the European Commission launched *Europa2020* – a strategy for smart, sustainable and inclusive growth (European Commission, 2010a). In the context of this strategy a package of measures was proposed to address the structural weaknesses of the European economy after the international financial crisis. Hence, *Europa2020* was designed as a strategy to coordinate the member states' economy and employment policies in the 2010-2020 decade (Marlier, Natali, and Van Dam, 2010). In order to measure the progress, a series of targets were set in the

following key areas: employment, research and development, climate change and energy, education, and poverty and social inclusion. Specifically, the target set in the employment policy requires member states to reach a 75% employment rate for the population aged 20 to 64 years by the year 2020 (European Commission, 2010a). This target was set out as a result of the low employment level in the EU compared to that of the US and Japan, where more than 70% of the working age population was employed with high levels of participation of women and older people in the labour market (Çolak and Ege, 2013).

Numerous investigations have analysed the progress of the *Europa2020* targets on a regional basis, and examined objectives reached on a per country basis (Çolak and Ege, 2013; Pasimeni, 2013; Rappai, 2016; Stec and Grzebyk, 2018). These studies addressing the territorial aspect in achieving the *Europa2020* targets have revealed the need to take into account regional specificities (Budd, 2013; Pagliacci, 2017) and have demonstrated the significant territorial disparities in the socio-economic field within the European Union (EU). Over the past few years, this has led to the European cohesion policy adopting a territory-based approach, which promotes integrated regional development strategies. The cohesion policy and the territory-based approach are key tools to achieve smart, sustainable and inclusive growth (European Commission, 2010b) and to improve the labour market conditions in EU regions. Besides, evidence shows that a number of diffusion mechanisms are used when implementing local and regional policy, causing neighbouring regions to adopt similar decisions (Shipan and Volden, 2008). The mechanisms by which such policies are diffused can be grouped into four categories: coercion, imitation, competition and learning (Meseguer and Gilardi, 2009; Simmons, Dobbin, and Garrett, 2006). These mechanisms are affected by common factors, leading to the appearance of spatial clusters on the one hand, and spatial interaction between regions on the other hand. While in certain studies spatial autocorrelation has been

detected in employment and unemployment (Elhorst, 2005; Fingleton, Olner, and Pryce, 2019; Kosfeld and Dreger, 2006; López-Bazo, Barrio, and Artís, 2005; McMillen, 2004; Niebuhr, 2003), few investigations have analysed the achievement of the *Europa2020* employment target from a spatial perspective.

Furthermore, in the European labour market there are still significant differences when broken down by gender (Bettio, Plantenga, and Smith, 2013). The increasing participation of women in the labour market would lead to greater social and economic benefits in Europe, and would make it regain a competitive position in the world economy (González and De los Ríos, 2010). According to Castellano and Rocca (2019), gender gaps in the labour market differ between the EU countries, but there are also significant regional differences within each country, and strong spatial clustering by gender. Therefore, in order to improve the employment situation for women, it is imperative to examine it from a regional perspective if the key targets set out in *Europa2020*, and the employment target in particular are to be achieved, both in regions where the employment rate is increasing and in neighbouring regions, as a result of the above-mentioned spatial diffusion effect.

Numerous studies have examined the factors affecting participation in the labour market, however there is minimal literature analysing the impact of those factors on the achievement of the strategy's employment target. Some investigations have examined the influence of GDP on unemployment through 'Okun's Law', highlighting the positive effect of economic growth on employment (Bartolucci, Choudhry, Marelli, and Signorelli, 2018). Other studies have shown the direct relationship between employment and education level (Noback, Broersma, and Van Dijk, 2013; Reid, 2002), finding that the higher the education level, the higher the chances that a man or woman will participate in the labour market (Van Ham and Büchel, 2006). The relationship between the employment rate and the population's education level has also been included in the

Europa2020 targets. Therefore, the second target set out in this strategy suggests increasing the percentage of the population aged 30 to 34 years who complete higher education (European Commission, 2010a).

This paper has three key objectives. First: To analyse the regions' spatial distribution in the achievement of the *Europa2020* target, in order to identify regional and gender disparities and their influence on reaching the target. Second: To analyse the presence of spatial interaction between neighbouring regions and its influence on the achievement of the female and male employment target. Third: To identify the determining factors and the extent to which they influence the achievement of the employment target, with a break-down by gender. In order to meet the first objective, maps are presented showing the regions that have reached the female and male employment target and in which countries those regions are concentrated, in this way thus examining the presence of spatial autocorrelation. In order to meet the second and third objectives, autologistic models are used, allowing the impact of certain factors on the likelihood of European regions' ability to meet the employment target for both men and women to be examined, as well as the presence of spatial spillover effect to be quantified. This study has been conducted on a group of 270 EU regions at NUTS 2 level, for the year 2017. It may help identify the strengths and weaknesses of the employment target addressed in the Europa2020 strategy, taking disparities between regions as well as gender differences into account. Furthermore, knowing which factors are involved, and to what extent they influence the achievement of the overall key target may be of interest when implementing policies within the regional socioeconomic frameworks.

This paper is structured as follows. The following section provides an analysis of the importance played by region and gender in the achievement of the strategy's target, spatial policy diffusion and the factors determining employment. The third section presents the

data and variables used in our study. In the fourth section, the econometric models' empirical results are detailed. The fifth and final section presents the conclusions and discussion.

4.2. Literature review and hypothesis

Numerous investigations have analysed the progress of the *Europa2020* targets. There is extensive literature analysing the achievement of the strategy in some of its key areas, such as 'poverty and social exclusion' (Ayllón and Gábos, 2017; Darvas, 2019; Nolan and Whelan, 2011; Petmesidou, 2017) or 'energy and climate change' targets (Böhringer, Löschel, Moslener, and Rutherford, 2009; Hatzigeorgiou, Polatidis, and Haralambopoulos, 2010; Liobikienė and Butkus, 2017; Parker, 2010; Warleigh-Lack, 2010). However, studies specifically analysing the achievement of the employment target are limited (Aceleanu, 2011; Skórska, 2015), especially those adapting a spatial approach for determining disparities between the European regions and differences by gender achieving this target.

4.2.1 Regional and gender analysis

Over the past decades, community policies have been fostering the convergence process between member states however, in the socio-economic field there are regional differences between many European countries (OECD, 2009). The Barca report (2009) calls for the European development policy to focus on the local dimension to face EU challenges. It highlights the need for a territorial approach, taking into account the fact that regions are endowed with different combinations of resources and specificities. This is the very approach that sustains the current EU cohesion policy reforms (Solly, 2016).

Numerous studies address the regional issue in following the Europa2020 strategy targets (Annoni and Weziak-Bialowolska, 2016; Pagliacci, 2017; Terem, Čajka, and

Rýsová, 2015; Todericiu and Boanta, 2017; Warzecha and Skórska, 2017). Those studies have pointed out the difficulties some countries experience in meeting the strategy targets, hence the need to take regional specificities into consideration (Budd, 2013). According to Dijkstra and Athanasoglou (2014), the great heterogeneity in European countries with regard to the achievement of Europa2020 calls for implementing policies from a regional perspective, helping to reduce the existing disparities. Hence, in order to meet the strategy targets, approaches considering ways in which different policy levels influence and affect each other are promoted (European Commission, 2010). Therefore, a territory-based approach seems like a convenient policy option for successful implementation of the strategy (Solly, 2016).

On another note, over the past decades, the increasing integration of women into the labour market has been one of the most relevant work-related phenomena in developed countries (Cebrián and Moreno, 2008; OECD, 2019). Nevertheless, despite the progressive inclusion of women into the labour market, significant differences remain when examined by gender (Peetz and Georgina, 2017). In the European context, the increase of females in the labour force and women's employment rate is paramount for achieving the *Europa2020* employment target. Moreover, these gender gaps in participation levels, unemployment rates, part-time contracts and segregation, differ between countries and even between individual regions within the country (Castellano and Rocca, 2019). Therefore, to monitor the employment target of the strategy, it is imperative to address the regional issue and the differences between men and women in the workforce.

4.2.2. Policy diffusion and spatial clustering

Recent studies have confirmed the presence of policy diffusion between regions, which means that public policies adopted by a regional government are influenced by

public policies from neighbouring governments (Gilardi, 2010; Simmons and Elkins, 2004). Policy diffusion is caused by certain mechanisms, which can be grouped into four essential categories: coercion, imitation, competition and learning (Simmons et al., 2006). Some of these mechanisms are related to the presence of spatial spillover effects (Chica-Olmo, González-Gómez, and Guardiola, 2013; Ruiz-Villaverde, Chica-Olmo, and González-Gómez, 2018).

The coercion mechanism is produced when a central government exerts pressure on the regional governments to adopt a certain public policy (Meseguer and Gilardi, 2009). This mechanism does not necessarily provoke autocorrelation and spatial interaction, as the imposed requirements are dictated by the central entity rather than by neighbouring regions. Besides, the *Europa2020* strategy is not a specific compulsion policy imposed on the member states. Its targets are a set of recommendations from the European Commission for the national administrations, with the aim of making a joint effort and mutual reinforcement within EU priority areas (European Commission, 2010a).

The imitation mechanism is produced when decisions taken by regional administrations are an imitation of those to be employed by other regions, without taking into account the effectiveness of a decision or policy (Shipan and Volden, 2008). In this case, autocorrelation and spatial interaction are likely to occur, as the regions' decisions will be affected by the decisions of their neighbours, even if their effectiveness is not taken into consideration (Chica-Olmo et al., 2013). Hence, the measures taken by the European regional administrations, aimed at achieving certain employment levels, are likely to be affected by the ones taken by their neighbouring regions, without considering the possible consequences for the target set.

Economic competition is another mechanism capable of provoking autocorrelation and spatial interaction. This occurs when regional administrations compete to adopt

certain policies, based on the results derived by other regions from the application of those policies. Thus, the economic impact of active employment policy adoption can be a reference for European regions from the same geographical area (Ruiz-Villaverde et al., 2018).

Finally, the learning mechanism is the process followed by a region to adopt the decision of other regions, once these decisions have proved to be successful (Berry and Baybeck, 2005). Hence, if a certain region has achieved a satisfactory employment level, this can benefit the employment level of its neighbouring regions (Overman and Puga, 2002) if similar policies are implemented.

In short, policy diffusion can lead to spatial autocorrelation and spatial clustering between regions, in such a way that an increase in the employment level in region i influences the employment level in the neighbouring regions (Niebuhr, 2003). In current literature, the existence of global spatial clustering is proven through analysis of spatial autocorrelation (Amara and Ayadi, 2013; Chhetri, Butcher, and Corbitt, 2014; Fischer and Getis, 2009). Few studies have analysed the achievement of the Europa2020 employment target using logit models (Sensier and Artis, 2016), and even fewer studies have analysed the spatial interaction in attaining this target.

The first hypothesis to be substantiated in this study is whether spatial clustering has occurred between European regions in the pursuit of the employment target. For that matter, it will also be interesting to substantiate a second hypothesis, of whether there is a radius of influence between regions, investigating the highest degree of mutual spatial dependence and establishing if this radius of influence is the same for female, male and total employment in the pursuit of the employment target. The third hypothesis addressed in our study is based on establishing whether spatial interaction has occurred, in other words, if the decisions adopted by regional administrations are influenced by the

decisions taken by the administrations of neighbouring regions. These hypotheses are supported by due policy diffusion, especially by imitation, competition and learning mechanisms.

Hypothesis 1 (H1): The spatial distribution of the regions meeting the Europa2020 strategy in female and male employment targets is not random, but shows high levels of clustering in the regions' spatial distribution.

Hypothesis 2 (H2): The presence of spatial autocorrelation in the achievement of the Europa2020 strategy for female and male employment between regions is maximised for a particular distance.

Hypothesis 3 (H3): Spatial diffusion mechanisms increase a region's likelihood of meeting the Europa2020 female and male employment targets.

4.2.3. Determinants of employment

Numerous investigations have analysed GDP as a determining factor in labour market participation rates through 'Okun's Law' (Bartolucci, Choudhry, Marelli, and Signorelli, 2018; Freeman, 2000; Moosa, 1997). This law established a direct relationship between unemployment and the cyclical component of GDP (Okun, 1963). This relationship has led to many scientific debates, but there is a broad consensus on the negative correlation between unemployment and GDP movements (Kangasharju, Tavera, and Nijkamp, 2012) and the resulting positive impact of economic growth on employment. The European Council's admission that GDP affects labour market performance made them assume this as a key indicator for the achievement of the targets established in the *Europa2020* strategy (Castellano and Rocca, 2019).

Furthermore, many studies have analysed how education levels influence the participation of women and men in the labour market (Castellano and Rocca, 2019; Greenlees and Saenz, 1999; Noback, Broersma, and Van Dijk, 2013; Reid, 2002). According to these studies, regions where a high percentage of the population has higher education levels, a higher employment rate for men and women is found (Noback et al., 2013). The attainment of higher educational goals is another priority of the Europa2020 strategy's intelligent growth. This target brings along two secondary targets: reducing school drop-out levels below 10% and increasing the population aged 30 to 34 years who complete higher education to 40% (Çolak and Ege, 2013). Thus, the European strategies for employment and education are interconnected, and the achievement of both is key to meeting the strategy on the whole (European Commission, 2010a).

Hypothesis 4 (H4): The chances that regions meet the Europa2020 male and female employment targets are affected by the variation in per capita GDP and by the achievement of the education target addressed in the strategy.

In addition to GDP and education level, other control factors may influence the employment rates for women and men, hence the achievement of the employment target. Thus, some research accounts for factors such as domestic work and care for dependants in the analysis of the participation of women in the labour market (Baxter, Hewitt, and Haynes, 2008; Craig, 2006; Cukrowska-Torzewska, 2016; Osnowitz, 2005). These studies have shown a disproportionate level of responsibility between men and women in their respective dedication to unpaid domestic work (Francavilla & Giannelli, 2013; Kelly, Ammons, Chermack, and Moen, 2010) which can prevent women's participation in the labour market (Cutillo and Centra, 2017; Haveman and Beresford, 2012; Shin,

2012; Song and Dong, 2018). To deal with this, many studies have incorporated variables related to the number of dependent people in the home, such as the dependency rate (Abellán-García, Esparza-Catalán, and Pérez-Díaz, 2011; Noback, Broersma, & Van Dijk, 2013) or the fertility rate (Del Boca and Locatelli, 2006; Del Boca and Vuri, 2007) into their analysis in order to evaluate their effect on the participation of females in the labour force.

Research also exists that has examined gender inequalities in the labour market through an examination of the structure of job opportunities (Blackburn, Jarman, and Racko, 2016; Fitzenberger, Schnabel, and Wunderlich, 2004). Thus, some research incorporates variables related to unemployment figures in order to analyze how the structure of job opportunities in a given region influences the participation of women and men in the labour market (Castellano and Rocca, 2019; Elhorst and Zeilstra, 2007; Van Ham and Büchel, 2006).

Thus, the fourth hypothesis to be substantiated in this study consists of establishing whether per capita GDP and meeting the education target affect the achievement of the *Europa2020* employment target, both for men and women, and whether there are other variables that could affect the achievement of this target.

4.3. Data

4.3.1. Study area

The study area for this study covers 270 regions at NUTS 2 level from the 27 countries which made up the EU in 2017. Cyprus has not been included, as the information of all variables used in this study was incomplete. The NUTS2 territorial division was chosen because it was the basic division used for implementing regional policies (European Commission, 2016). If an analysis is carried out at this spatial level, regional details can

be observed, with the aim of implementing adequate policies for achieving the *Europa 2020* employment target.

Table 5. Descriptive statistics

Statistic	Mean	St. Dev.	Min	Max	Descriptio
Target_male	0,752	0,433	0	1	Binary variable which takes value 1 if the region has for the population aged 20 to 64 years which is great otherwise.
Target_female	0,2	0,401	0	1	Binary variable which takes value 1 if the region has rate for the population aged 20 to 64 years which is zero otherwise.
Target_education	0,415	0,494	0	1	This variable takes value 1 if 40% of the population has higher education, and zero otherwise.
GDP	102,525	120,488	2,790	1,295,60	Per capita GDP divided by average per capita GDP
Gap_unemployment	0,824	2,974	-2,900	18,000	Difference between female and male unemployment
Population	1,077	0,881	0,050	7,168	Working-age population (16 to 64 years) in millions
Dependency_rate	26,922	3,869	19,619	40,773	$\frac{Number\ of\ persons<14+Number\ of\ persons>65}{Number\ of\ persons\ from\ 14\ to\ 65\ years\ age} * 100$ (%
Fertility_rate	1,584	0,203	1,03	2,3	Number of children a woman would have if she live childbearing years

Sources: Authors' calculations based on data generate from Statistical office of the EU (EUROSTAT).

4.3.2. Data and variables

Table 5 shows the variables used in the study, and their description. All data for this study has been obtained from regional statistics provided by the Eurostat database.

In our study two binary variables related to the achievement of the *Europa2020* employment target (*target_female and target_male*) were taken into consideration. These variables take value 1 if female (*target_female*) or male (*target_male*) employment rate of region *i* is greater than or equal to 75% for the population aged 20 to 64 years, otherwise it takes a zero value. Table 5 shows that 75% of regions have met the male employment target, but only the 20% of regions have attained the female employment target. This shows the gap between male and female employment, and the impact of the latter on the global achievement of the target.

In order to measure the impact of economic growth on the strategy, the *GDP* variable was used. This variable is calculated as follows: per capita GDP divided by average per capita GDP of EU-27, multiplied by 100. It allows us to compare each region's GDP, to establish if it is above or below the average and how it relates to the achievement of the target.

For investigating the compatibility degree between the employment target and the education target addressed in *Europa2020*, i.e., the attainment of the second target being able to affect the achievement of the first, a binary value *target_education* is used. This variable takes value 1 if in region *i* 40% of the population aged 30 to 34 years has a higher education level, and zero otherwise.

In addition to these independent variables, other control variables have been selected that can have an influence on whether regions reach a male and female employment rate of 75% or more. Therefore, in order to get closer to the regional conditions of the labour market, we have used *gap_unemployment*, which is calculated as the difference between

the female and male unemployment rate. The work involved in caring for dependents, either children or elderly people, is identified with control variable *dependency_rate*. This variable is calculated as the ratio between the sum of the amount of people younger than 14 years and older than 65 years, and the amount of people aged between 14 and 65 years, multiplied by 100:

$$dependency\_rate = \frac{Number\ of\ persons < 14 + Number\ of\ persons > 65}{Number\ of\ persons\ from\ 14\ to\ 65\ years\ age} * 100$$

To measure fertility options, we use the fertility_rate variable. This variable is calculated as the average number of children born per woman, based on the premise that all women live until the end of their childbearing years and give birth in accordance with the average fertility rate for each age. Finally, we have included the population variable, which measures the working-age population (from 16 to 64 years) in millions of people, in each analysed region.

Figure 4 shows the NUTS2 regions that reached the employment target proposed by the European strategy in 2017, for female and male employment. In all two cases spatial clustering is observed, but the formation of clusters shows strong differences when results are broken down by gender. This clustering could be an indicator of the link between one region's achievement of the Europa2020 employment target and its effect on neighbouring regions in meeting this target as well.

The regions which have met female employment objectives are especially concentrated in Germany (DE), United Kingdom (UK) and Sweden (SE). As for male employment, on the one hand strong spatial disparities are observed region to region within the country itself, such as in the case of Spain (ES), France (FR), Italy (IT) or Poland (PL). On the other hand, in countries such as Germany (DE), United Kingdom (UK), Sweden (SE), Netherlands (NL), Czech Republic (CZ), Austria (AT), Ireland (IE),

Estonia (SI) or Denmark (DK) all regions met the above-mentioned target. Many of those countries set aside a large percentage of their budget towards labour market activation programmes, resulting in higher levels of employment (Eurostat, 2020).

Figure 4. Spatial distribution of European regions – at NUTS 2 level – whether or not those met the female (A) or male (B) employment objectives of the Europa2020 strategy for 2017. Source: Elaboration based on EUROSTAT data.
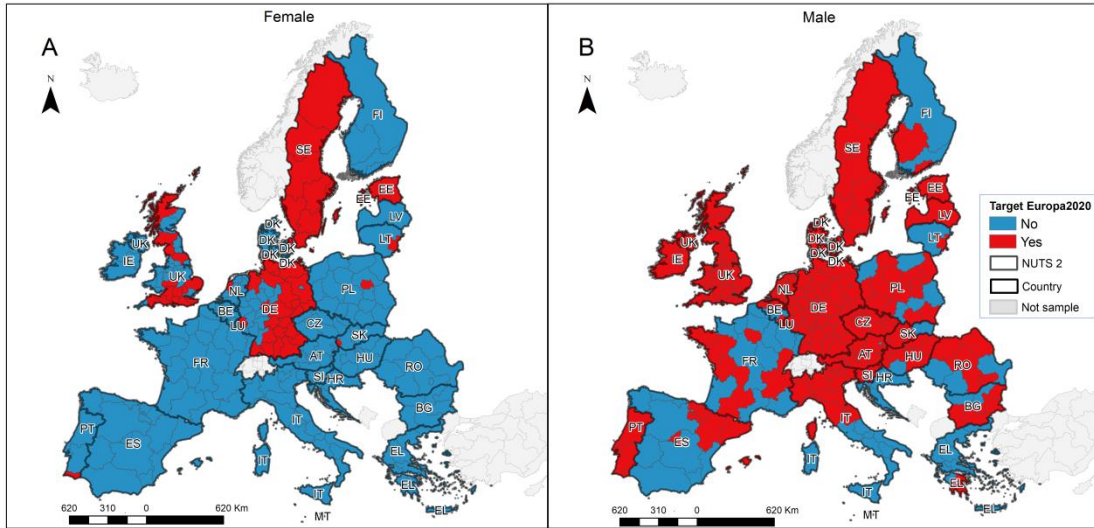
4.4. Results

4.4.1. Spatial autocorrelation

In order to substantiate the existence of spatial autocorrelation statistically, in other words, if the regions that met the *Europa2020* employment target were grouped in spatial clusters, the Jtot Joint Count Test expression was used (Cliff & Ord, 1981):

$$Jtot = \frac{1}{2} \sum_i \sum_j w_{ij} y_i y_j \qquad (1)$$

In which: y_i is a binary variable that takes value 1 if region i met the employment target, and 0 if the target was not met; i and j represent two different regions; and w_{ij} are the elements of a spatial weights matrix W that has been row standardized, which specifies if regions i and j are neighbouring regions.

Different types of vicinity can be used (Anselin, 2003). In accordance with Tobler's first law of geography (1970), which states that everything is related to everything else, but near things are more related than distant things, we have used a *W* binary matrix with threshold, where the elements of this matrix are:

$$w_{ij} = \begin{cases} 1 & \text{if } d_{ij} \leq \text{ threshold} \\ 0 & \text{if } d_{ij} > \text{ threshold} \end{cases} \tag{2}$$

In which d_{ij} is the distance between the *i* and *j* regions' centroids and threshold is the maximum considerate distance between regions.

Table 6 shows that spatial autocorrelation with a 95% significance level, for female and male employment, is observed for threshold distances. The results obtained confirm the earlier observations from Figure 4, which indicate a high level of clustering in the regions' spatial distribution. These results substantiate hypothesis 1 (H1) of our study, meaning that the regions' spatial distribution has reached the *Europa2020* female and male employment target, concluding that it is not random, and that spatial clusters are formed.

Table 6. Joint Count-test (Jtot) for female and male employment target

Female	threshold = 250km
Jtot	29.411
z-value	-8.719
p-value	0.000
Male	threshold = 800km
Jtot	40.188
z-value	-16.967
p-value	0.000

In order to determine at what distance the highest level of spatial dependence between regions is reached, a Jtot statistic was obtained by using weight matrix, but taking different threshold values into consideration of w_{ij} in expresión (2). Thus, in Figure 5, the

significance level and z-value (in absolute terms) are shown for the Jtot statistic of different distances (in 50 km increments until 2000 km), for female (Figure 5A) and male (Figure 5B) employment. In the case of female employment there is evidence of spatial autocorrelation at 95% significance level from 100 km to 1500 km, while in the case of male employment it is from 100 km to 2000 km. However, according to the z-value, the distance for which the null hypothesis of no spatial autocorrelation is most likely to be rejected (Orford, 2004) is 250 km for female employment and 800 km for male employment (see Table 6). These results substantiate hypothesis 2 (H2) of our study, in other words, the presence of spatial autocorrelation in the achievement of the *Europa2020* strategy for female and male employment between regions is maximised for distances between 250km and 800km.

Figure 5. Z-value in absolute terms of the spatial autocorrelation Jtot-test of regions that met the Europa2020 target in female (A) and male (B).
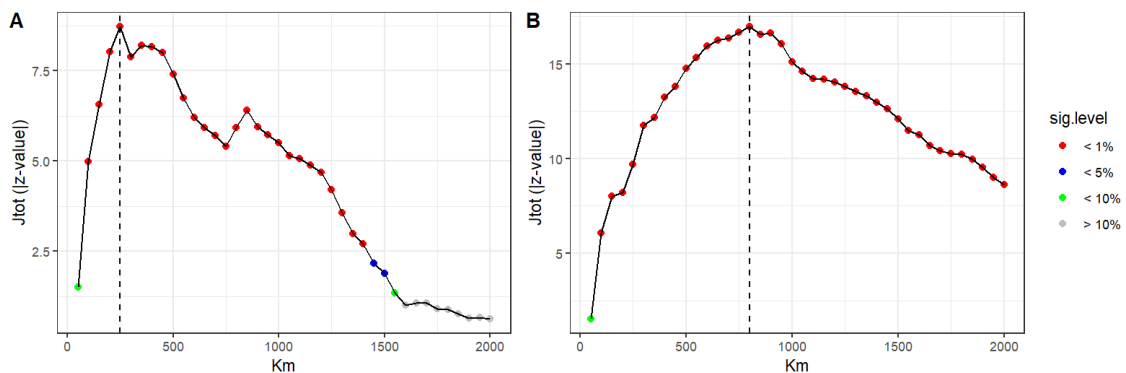
4.4.2. Models

To analyse the factors that determine the likelihood of European regions to meet the *Europa2020* employment target, two types of models have been specified: one for female employment and the other for male employment. The explained variables of these two models are the *target_female* and *target_male* binary variables, respectively. It is supposed that the probability *p* of region *i* meeting the *Europa2020* employment target (female or male) depends on explanatory variables and whether neighbouring regions meet it.

In this paper an autologistic model is used for spatial data with binary explanatory variables (Besag, 1974). Autologistic models are widely applied in ecology and natural sciences, but little used in the social sciences (Ward and Gleditsch, 2002). Caragea and Kaiser (2009) showed that the traditional autologistic model does not provide adequate interpretation of the model's parameters. They proposed a centered autologistic model:

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$$\log \frac{p(y_i = 1 \mid y_j \in N_i)}{p(y_i = 0 \mid y_j \in N_i)} = x'\beta + \eta \sum_{j \in N_i} (y_j - \mu_j) \qquad (3)$$

where: represents the observation of region i as it meets the *Europa2020* employment

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target ($y_i = 1$) or not ($y_i = 0$); is a set of locations neighbouring y_i; $p(y_i = 1 \mid y_j \in N_i)$ represents the probability that the *ith* region meets the *Europa2020* employment target is conditioned by values of neighbouring regions; *x* is a vector of explanatory variables; β is a vector of regression coefficients associated with explanatory variables; η is the spatial dependence parameter, which represents the spatial spill-over effect; $\mu_j = \left\{ 1 + \exp(x_j' \beta) \right\}^{-1}$ represents the independence expectation of y_j and $(y_j - \mu_j)$ represent the residuals which filter the large-scale structure.

When $\mu_j = 0$ the expression (3) is the classical autologistic model and $\sum_{j \in N_i} y_j$ is called autocovariate and represents the number of neighbours that meet the Europa2020 employment target. When $\eta = 0$ the expression (3) is the classical logistic model and the values explanatory variable, y_j, are distributed spatially independent. However, when $\eta \neq 0$, the autologistic model takes spatial dependence into account. In our case, we suppose that $\eta > 0$, that is, that there is positive spatial dependence. This means that as the number of neighbours of the *ith* region that meet the Europa2020 employment target increase, the probability of this region achieving this target also increases. Therefore, in the case that this parameter is significantly greater than zero, it would allow us to test hypothesis 3 (H3).

To carry out the estimates of the model presented in this work, the method proposed by Hughes, Haran and Caragea (2011) where the adjacency weight matrix W should be binary and symmetric. To consider the neighbourhood between regions, two binary connectivity matrices have been used: for target_female and   for target_male with the elements of these two matrices being:

$$w_{ij}^f = \begin{cases} 1 \text{ if } d_{ij} \leq 250 \text{ km} \\ 0 \text{ if } d_{ij} > 250 \text{ km} \end{cases} \qquad w_{ij}^m = \begin{cases} 1 \text{ if } d_{ij} \leq 800 \text{ km} \\ 0 \text{ if } d_{ij} > 800 \text{ km} \end{cases} \qquad (4)$$

Different methods have been proposed to estimate the autologistic model. The maximum pseudo-likelihood estimator (MPLE) has been widely applied (Sherman, Apanasovich and Carroll, 2006). This method is generally consistent and asymptotically normal (Guyon and Künsch, 1992), but it tends to be inefficient when spatial interaction is strong (Besag and Moran, 1975). However, in the case of a centered autologistic model, MPLE is easier to understand and to implement than other methods such as Monte Carlo maximum likelihood and Markov chain Monte Carlo Bayesian inference. It is statistically efficient when the sample size increases and also for moderate spatial dependence (Hughes, Haran & Caragea, 2011). This method also has been recommended for spatio-temporal autologistic models (Gégout-Petit, Guérin-Dubrana and Li, 2019). In order to obtain confidence intervals, a bootstrap sample is used. In our case 1000 samples have been used.

In order to determine the impact of the variables of interest (*Target_education* and *GDP*) and spatial interaction, on the likelihood of meeting the strategy's employment objective, different nested models were presented for both female and male employment. Thus, a classic-logit baseline model was established for female employment (Mod0.Female) and another for male employment (Mod0.Male), in which only the control variables are included. Also, two other classic-logit models (Mod1.Female and Mod1.Male) with variables of interest were estimated in order to test hypothesis 4 (H4), in other words, to examine the influence of GDP per capita and the achievement of the education target on that region's probability of meeting the *Europa2020* male and female employment targets. None of these four models show serious multicollinearity problems, as the variance inflation factor (VIF) never exceeds a value of 10 (see Table 7). On the

other hand, to test hypothesis 3 (H3), the influence of spatial diffusion mechanisms on the probability of a region to reach the Europa 2020 objectives for female and male employment, two autologistic models (Mod2.Female and Mod2.Male) were estimated which include spatial dependence parameters to control spatial interaction.

In order to substantiate whether the inclusion of the spatial interaction and variables of interest as related to hypothesis 4 (H4) of this paper significantly improve the baseline model, the Likelihood ratio test has been applied, allowing a comparison of the model Mod1 with model Mod0 and model Mod2 with model Mod1, for both female and male employment (see, Table 7). It is found that models in which variables of interest (Mod1) are included are more appropriate than models in which those variables are not included (Mod0), both in the case of female and male employment. Also, these tests allow for the conclusion that the models that include spatial interaction (Mod2) are more appropriate than models that do not include spatial interaction (Mod1), both in the case of female and male employment. In all cases we reject the idea that models Mod0 are better than models Mod1, and models Mod1 are better than models Mod2.

On the other hand, a lower Akaike Information Criterion (AIC) as well as a higher R2-McFadden value or R2-count is observed in the Mod2 models than in the Mod1 models, which indicates that the autologistic model is more appropriate than the classic-model for the identification of spatial diffusion effects.

In Table 7 we can also observe that parametre η is positive and significant, indicating positive spatial dependence in the achievement of the *Europa2020* employment target for Mod2 models. This indicates the existence of spatial spill-over effect or spatial interaction caused by spatial diffusion mechanisms. This result substantiates hypothesis 3 (H3) as addressed in this paper.

As for the *target_education and GDP* variables, a significant positive effect is observed of these variables impacting the likelihood of meeting the employment target, both for women and men. This means that reaching the education target proposed by *Europa2020* and a rise in *GDP* levels increase the likelihood of achieving the strategy's employment target. This result substantiates hypothesis 4 (H4) as suggested in this paper. Finally, with regard to the control variables, the indirect and direct relationship of the variables *gap_unemployment* and *fertility_rate* respectively, can be observed. This means that a larger unemployment gap decreases the likelihood of meeting the strategy's employment target and conversely, a higher fertility rate has a positive impact on meeting the targets in all models. The *population* and *dependency_rate* variables, on the other hand, are only significant in female models, with a negative effect on the explanatory variable of these models. This indicates that a large labour force (*population*) and high numbers of dependents (*dependency_rate*) have a negative impact on the female employment rate reaching 75% or more.

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Table 7. Models

	Female			Male		
	classic		autologistic	classic		autologistic
	Mod0	**Mod1**	**Mod2. W^f**	**Mod0**	**Mod1**	**Mod2. W^m**
Const.	-5.230**	-6.148**	-4.842	-0.734	0.332	-1.568***
Gap_unemployment	-0.321*	-0.409**	-0.641***	-0.199***	-0.137*	-0.114***
	(0.726)	(0.664)	(0.527)	(0.820)	(0.872)	(0.892)
Population	-0.353	-2.390***	-2.184***	-0.051	-1.760***	-1.028***
	(0.702)	(0.092)	(0.112)	(0.951)	(0.172)	(0.358)
Dependency_rate	-0.195**	-0.373***	-0.313***	-0.156*	-0.354***	-0.060***
	(0.823)	(0.689)	(0.731)	(0.856)	(0.702)	(0.942)
Fertility_rate	5.836***	9.324***	7.287***	4.053**	6.614***	2.319***
	(34.241)	(11203)	(1461.8)	(57.540)	(745.51)	(10.165)
Target_education	--	1.201**	1.152***	--	0.992**	1.096***
		(3.322)	(3.166)		(2.697)	(2.993)
GDP	--	0.013***	0.012***	--	0.019***	0.009***
		(1.013)	(1.012)		(1.019)	(1.009)
η	--	--	0.321***	--	--	0.514***
Max. VIF	3.462	3.521	--	3.462	3.522	--
R2-McFadden	0.226	0.257	0.347	0.146	0.262	0.338
R2-count	0.778	0.781	0.833	0.807	0.822	0.841
AIC	242.24	214.84	192.49	268.46	237.31	216.21
LR-Chisq	--	31.40***	24.35***	--	35.16***	23.10***

Note: Signif. codes: '***'<0.001, '**'<0.01, '*'<0.05, ' ' not significant. Odds-ratio in brackets. n = 270 for all models. LR-Chisq represents the chi-squared of likelihood ratio test.

As for the target_education and GDP variables, a significant positive effect is observed of these variables impacting the likelihood of meeting the employment target, both for women and men. This means that reaching the education target proposed by *Europa2020* and a rise in GDP levels increase the likelihood of achieving the strategy's employment target. This result substantiates hypothesis 4 (H4) as suggested in this paper.

Finally, with regard to the control variables, the indirect and direct relationship of the variables gap_unemployment and fertility_rate respectively, can be observed. This means that a larger unemployment gap decreases the likelihood of meeting the strategy's employment target and conversely, a higher fertility rate has a positive impact on meeting the targets in all models. The population and dependency_rate variables, on the other hand, are only significant in female models, with a negative effect on the explanatory variable of these models. This indicates that a large labour force (population) and high numbers of dependents (dependency_rate) have a negative impact on the female employment rate reaching 75% or more.

4.5. Conclusions and discussion

This paper analyses the presence of spatial interaction and the impact of determining factors in the achievement of employment targets as set out in the *Europa2020* strategy for both female and male employment in 2017, throughout 270 European regions at NUTS 2 level. Studies that have analysed the success rate of regions reaching the *Europa2020* objectives from a spatial perspective are limited. For these reasons, four hypotheses have been put forward in our study and tested in the results section.

In hypothesis 1 (H1) and 2 (H2) as tested in this study, there is evidence to suggest a high presence of spatial autocorrelation, in other words, a high level of clustering within the regions' spatial distribution can be seen, and also that the impact of said presence of spatial autocorrelation in the achievement of the *Europa2020* strategy is much higher for male employment (800 km) than for female employment (250 km), showing strong regional and gender differences amongst those regions that reach the employment objective. These results have strong implications from a political standing as they show on the one hand, the need to adopt a territory-based approach when applying public

employment policies and the need to take regional specificities into account (Budd, 2013; Solly, 2016). On the other hand, they show the importance of analysis from a gender perspective, and the need to reduce the gender gap in the labour market on a regional basis (Castellano and Rocca, 2019; Peetz and Georgina, 2017).

In hypothesis 3 (H3) of this paper evidence is shown of the existence of spatial interaction, which means that reaching the target in one region has a positive impact on the target being achieved by neighbouring regions. Furthermore, in the case of male employment, this spatial interaction is more accountable than for female employment concerning targets being reached. According to Ruiz-Villaverde et al. (2018), regional governments are not geographically isolated in adopting certain policies and spatial interaction is caused by diffusion policy mechanisms. These results also have important implications for public bodies when implementing policies aiming to reach target employment objectives as set out in the *Europa 2020*, as they reveal how neighbouring regions' policies will influence those of another region due to imitation, competition and learning mechanisms (Shipan and Volden, 2008). In conclusion, this study could prove the existence of a "domino effect" in the achievement of the *Europa2020* target between neighbouring regions that this is motivated by imitation, competition and learning mechanisms

Lastly, in hypothesis 4 (H4) it is evident that the *Europa2020* employment target is influenced by GDP and education level, both for women and men. Thus, the *GDP* variable reveals the positive relationship between economic growth and employment (Okun, 1963), in accordance with studies analysing the negative impact of unemployment on GDP movements (Kangasharju et al., 2012). Furthermore, the achievement of the education target proposed in the strategy is substantiated to increase the likelihood of meeting the employment target, hence the level of education affects the level of

employment (Castellano amd Rocca, 2019; Noback, Broersma, and Van Dijk, 2013). These results confirm that employment is not an isolated and independent variable and rather is directly related to other factors which need to be taken into account when encouraging labour market participation throughout the regions. Thus, knowing what these factors are and to what extent they influence the achievement of the target for both female and male employment provides us with very relevant information from a political and socio-economic viewpoint in order to direct public policy efforts towards these factors. In conclusion, the findings of this paper have major implications for the implementation of policies within the regional socio-economic frameworks, as they highlight the weak and strong points of future measures to be determined in order to meet the *Europa2020* employment target.

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Capítulo 5:
The Impact of Employment Quality and Housing Quality on Human Development in the European Union

The Impact of Employment Quality and Housing Quality on Human Development in the European Union

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Abstrac

This study aims to contribute new information on how and through which factors employment quality and housing quality can be improved from a human development approach so that people can live the life they want. Using the human capabilities approach as a theoretical reference framework, the article analyses the effect of involuntary part-time employment and overcrowded housing on the Human Development Index (HDI). The empirical analysis is based on the panel data technique, which is applied to data from the European Statistical Office (Eurostat) and the United Nations Development Programme (UNDP) for the 28 member countries of the European Union. The results shed new evidence on how involuntary part-time work and overcrowded housing limit or hinder people from living the lives they want, at least in the dimensions measured by the HDI.

5.1. Introduction

Since the 1950s, studies on the impact of employment on improving quality of life have mainly been aligned with theoretical approaches of economic growth [1] and have therefore mainly investigated the mechanisms that contribute to increasing economic income [2]. From the perspective of human development theories, however, research must be oriented towards how monetary income affects the expansion of capabilities so that people can do and be what they really want [3].

Similarly, from the perspective of the human development paradigm, the United Nations Development Programme (UNDP) emphasises the importance of providing real opportunities as a mechanism for people to access the labour market and achieve their life goals [4]. However, although public policies to support the creation of new jobs are based on UN recommendations, very few studies have provided insight into the determinants of employment quality [5,6], that is, the specific factors of labour market activity that would allow people to lead the lives they want. In this line of thought, Sehnbruch [7] argued that incorporating certain job quality indicators in the analysis of human development provides a broader vision of the labour market and a better explanation of the capabilities and functionings generated by employment.

Investigations have identified housing as one of the key socioeconomic indicators for evaluating quality of life [8,9,10]. Housing is a safe, physical space for families to coexist and transmit values and as such has become one of the basic goods to determine a society's welfare [11]. For this reason, several studies have argued that the capability to have a home should not be analysed only from the viewpoint of providing shelter, but that it is also necessary to identify the fundamental components of housing quality in order to determine people's well-being [12,13,14,15]. In other words, it is necessary to analyse the minimum housing conditions so that the members of a household can live the lives they truly desire.

In accordance with the above, the main objective of this study is to provide new information on how and through what elements the quality of employment and housing can be improved from the perspective of human development, so that people increase their capabilities. To this end, the human capabilities approach (HCA) is used as a theoretical reference framework and an empirical analysis is carried out to examine the impact of involuntary part-time employment and overcrowded housing on human

development. The analysis is performed using European Statistical Office (Eurostat) and UNDP data for the 28 member countries of the European Union. The statistical information is processed and analysed using the panel data technique.

The paper is structured as follows. Section 2 presents the conceptual framework and the study hypotheses, as well as a description of the methodology and data. The results are analysed in Section 3. Section 4 contains the discussion. Finally, the conclusions and limitations of the study are presented in Section 5.

5.2. Hypotheses, materials and methods

5.2.1. Theoretical Framework and Hypotheses

Historically, per capita GDP has been the macroeconomic indicator used to measureproductivity and development [16]. However, it has become clear that in order to measuredevelopment from a multidimensional perspective, it is necessary to go beyond purelyeconomic indicators [2]. Measuring development through variables such as per capita GDP or national wealth perpetuates the traditional approach that links development toeconomic growth and opulence [17], while development that seeks citizens' well-beingmust focus on the positive freedoms or capabilities of individuals [18].

The HCA, originally developed by Amartya Sen, is one of the most widely usedapproaches for measuring development and well-being from a multidimensional perspec-tive [19]. As a result of Sen's contributions to the development of an alternative measure ofquality of life to traditional well-being approaches, he is now considered one of the maintheoreticians of human development [3]. The HCA expands on the concept of wealth toevaluate what people are capable of doing or being.

Three key concepts are central to the notion of the HCA: capabilities, agency andfunctionings [3,20,21]. Capabilities are what people have the freedom to do and

agencyis the ability of people to pursue the goals they have voluntarily set for themselves (i.e., people lack agency when they engage in compulsory activities) [22], while functioningsare understood as what people can actually do or be [23]. Functionings are analysed froma normative perspective; but in light of this, the HCA suggests that their neutrality berecognised. According to Robeyns [3], functionings are constitutive elements of human lifethat can produce both well-being and ill-being. Therefore, the notion of functionings shouldbe defined as a value-neutral category in the sense of an action to produce outcomes aboutwhich society makes value judgments as to their appropriateness. Thus, when analysinglabour market activities, the action of working as a functioning will be associated with apositive, negative or simply trivial value for the person who performs the activities or forsociety [24].

Understanding functionings as activities that are actually performed and capabilitiesas the freedoms to achieve these functionings allows us to distinguish the dimensionsin which interpersonal comparisons of advantages are made, which constitute one ofthe most important aspects of human capabilities-based analyses [3]. Similarly, whilefunctionings are universal or constitutive of human life, some actions or events may notbe constitutive but rather dependent on social structures, what are known as "context-dependent functionings" [3]. In line with the above, and for purposes of analysis, since theaction of being employed in the world of work is a human activity, it is a functioning.

Sen [25] states that through work and income, functionings, capabilities and, ulti-mately, utility are generated for the employed person. However, a true application of the capabilities approach to employment involves recognising the factors that influencethe individual's ability to convert the characteristics of a given job into a set of attainablefunctionings [26,27]. Therefore, instead of considering only the quantity of employment, attention should be also paid to factors related to the quality of employment

in order totruly determine the capabilities and well-being of individuals. In this regard, employmentquality is an important explanatory factor for the capabilities and functionings that indi-viduals can generate, since it takes into account what people can achieve with a given setof job characteristics [7].

Research has shown that involuntary part-time work is a key indicator of employmentquality as this type of work has certain characteristics that influence the well-being ofworkers [6,28]. According to the International Labour Organization (ILO), there are variouskinds of employment depending on the type of authority, the type of economic risk, theduration of the work agreement, the type of work agreement, forms of remuneration orthe place of work [29]. However, there are common elements in these definitions whichindicate that a worker is a person who performs a set of human activities to producegoods or services in an economy or who meets the needs of a community and providesthe necessary means of support for individuals [29]. Therefore, the action of working is afunctioning that depends both on the skills and abilities of the person who performs thework and on the social and institutional circumstances in which the work activity is carriedout; in other words, the action of working is a context-dependent functioning.

A second analysis of work as a functioning involves recognising its neutrality; thatis, the action of being employed does not depend on the impact of the activity on society, but on the certainty that a person has performed the action of creating goods or services. Once such an action is materialised, the person who performs it and society will makevalue judgements as to its appropriateness. Thus, when the action of working is identifiedas a neutral functioning, it is possible to study the action from a normative point of view, which implies making value judgments about whether something is better or worse thansomething else. Alkire [22] described the HCA as a proposition for evaluating

socialarrangements according to the degree of freedom people have to promote or achieve thefunctionings they value. Robeyns [3], however, argues that if functionings can be valuedpositively or negatively, then we must acknowledge that people's lives are better if theycontain fewer of the functionings that are valued negatively, such as physical violence orstress. Thus, for Robeyns, Alkire's proposal should be extended by adding at the end "andto promote the weakening of those functions that have a negative value."

Thus, when introducing the normative aspect into the action of working, this humanactivity should be viewed as a refined functioning, that is, one that is chosen from among aset of possibilities [30]. In this sense, it can be inferred that, in the framework of the HCA, work that enables people to lead the life they really want must have the characteristics of arefined functioning [3]. Similarly, the outcome of the work, in addition to benefiting theworker, must be positive for society, thus facilitating the realisation of functionings andexpanding the capabilities of other people.

In practice, the European Commission measures and monitors the different types oflabour in the European Union mainly through the Eurostat. This organisation classifiesemployment according to working time. Under this classification, involuntary part-timework is defined as work performed by workers as a result of not having been able tofind a full-time job despite their desire to do so [31]. In acknowledging the conceptualneutrality of functionings, it is possible to state that involuntary part-time work constitutesa functioning because it denotes the performance of a human activity. However, from anormative standpoint, the evaluation of this functioning cannot go beyond its definition, that is, as a means of subsistence for the person performing it.

The results of studies that analyse the impact of some types of involuntary work, suchas self-employment out of necessity, indicate that when people are forced to perform aneconomic activity as the only option for their survival, they have limited agency. This

canlead to dissatisfaction with the activity, since there is no opportunity to exercise one's free and choose what one would really like to do. A direct relationship has also been foundbetween involuntary part-time work and working poverty, since these types of jobs arepoorly paid and performed solely for purposes of subsistence [6,28]. This implies that itis a functioning which limits the agency of the person performing the job, because theydo not have the freedom to choose the job they would like due to the lack of employmentopportunities [28].

Therefore, it could be inferred that involuntary part-time work is an activity thatinvolves an action and produces changes, but it makes it difficult for people to develop thelife they really want. This brings us to our first hypothesis:

Hypothesis 1 (H1): Involuntary part-time work restricts the expansion of human capabilities forpeople to be able to lead the life they want

On the other hand, capabilities can be measured by real access to the freedoms thatallow people to achieve the lifestyle they desire. Similarly, freedoms are not only theprimary ends of human development, but also part of its principal means [18]. In thisregard, there is a long list of instrumental freedoms that help people improve their quality oflife. In particular, political freedoms, economic facilities, social opportunities, transparencyguarantees and protective security can be considered basic instrumental freedoms becausethey affect most aspects of people's decisions about how they want their lives to be [18].

As concerns the fundamental right of every person to have decent housing, this aspectis associated with instrumental freedoms related to social opportunities and protectivesecurity. The right to housing is enshrined in Article 25 of the Universal

Declaration ofHuman Rights, making it a basic fundamental right or, in Sen's [18] words, an instrumentalfreedom that contributes directly to the "overall freedom people have to live the way theywould like to live."

Numerous studies have identified housing as one of the fundamental elements ofwell-being [12–15]. Indeed, housing is a material dimension that determines the well-beingof human beings, not only because it is the physical space where we live, but also because itis the place where people spend more than half of their daily lives. Therefore, the capabilityto have a home should not be interpreted only in the restrictive sense of providing shelter, but should be considered the right to live in decent or adequate housing. In this sense, the Office of the UN High Commissioner for Human Rights establishes that for housing to beconsidered adequate, it must meet at least the following criteria: security of tenure, housingquality in terms of the availability of basic public services, adequate space, affordability, habitability, accessibility to meet the specific needs of disadvantaged and marginalisedgroups and cultural adequacy [31].

Therefore, guaranteeing sufficient space is one of the basic characteristics for a hometo be considered adequate. Some studies, such as those of Rindfuss et al. [32], Pan [33]and Kutty [34], indicate that overcrowding (lack of sufficient space within the home) isone of the fundamental elements for measuring housing quality. For its part, the EuropeanCommission [35] also considers the rate of overcrowding as one of the key indicators formeasuring housing quality.

Thus, in addition to the capability to have a home, we incorporate the real freedomthat a person has to access a decent home, that is, the minimum conditions that allowpeople to achieve their life expectations. In this sense, living in an overcrowded homeadversely affects people's overall capabilities, as it restricts basic instrumental freedoms,

particularly protective security.   Therefore, living in overcrowded conditions influenceshuman development, as inferred in the second hypothesis of this study:

Hypothesis 2 (H2): When people live in overcrowded conditions, their capability to do and bewhat they really want is restricted.

5.2.2. Materials

5.2.2.1. Dependent variable

Following the theoretical framework of Sen's approach, the UNDP adopted the human development concept in 1990, which is now measured globally by the Human Development Index (HDI) [36]. This index comprises three dimensions: a long and healthy life, knowledge and a decent standard of living [37]. Therefore, the HDI was used in this study as a dependent variable. Dhahri and Omri [37] also used the HDI to identify the contribution of entrepreneurship to sustainable development. The data for the HDI indicator were obtained from statistics provided by the United Nations.

5.2.2.2. Independet variable

To analyse the effect of involuntary part-time work on an individual's human development, the rate of involuntary part-time employment (IPE) has been used. This variable is calculated as the proportion of workers who were unable to find full-time work over the total number of part-time workers. This variable has been used in numerous studies as an indicator to measure employment quality, as it is related to low-paying, low-productivity work, and also indicates the lack of suitable alternative employment opportunities [6,28].

To measure the effect of living in overcrowded conditions on an individual's human development, the variable overcrowding rate (OVER) was used. This variable has been used in numerous studies because it is considered one of the key dimensions for evaluating the quality of housing [32,33,34] and is calculated as the percentage of the population living in an overcrowded household. According to the Eurostat, a person is considered as living in an overcrowded household if the household does not have at its disposal a minimum number of rooms equal to: one room for the household; one room per couple in the household; one room for each single person aged 18 or more; one room per pair of single people of the same gender between 12 and 17 years of age; one room for each single person between 12 and 17 years of age and not included in the previous category; and one room per pair of children under 12 years of age [35].

In addition, two control variables have been used. The first control variable is employment rate (EMP), which is calculated as the percentage of employed persons aged 20 to 64 years over the total working-age population. EMP measures the employment supply or "job quantity" available in a given country. This variable is a key indicator of labour market development [6] and has been used to determine the impact of employment supply on economic growth [38]. The second control variable is migration rate (EMI), which is calculated as the percentage of migrants in relation to the country's total population. The data for these four indicators were obtained from the Eurostat statistical database.

5.2.3. Methods

The data for this study covered the 28 countries of the European Union for the period 2006–2018. When there is information over time in the same cross-sectional units, it is feasible to design models in which temporal and cross-sectional data are combined using the panel data technique [39]. One of the main advantages of this technique is the

possibility of quantifying the time-invariant unobservable factors related to the cross-sectional units that influence the dependent variable [40,41,42].

To capture these factors related to the cross-sectional units, there are two types of specifications: the fixed effects (FE) model, which assumes that the original order changes constantly for each unit; and the random effects (RE) model, which assumes that the original order is formed by a constant and a random part [40]. However, before determining whether the FE or RE specification is more adequate, it is important to rule out a pooled model, which does not consider the presence of effects of the different units. The results of the Fand Breusch–Pagan tests indicated that the panel data technique was more suitable for this study than the pooled model estimated by the ordinary least squares method.

Moreover, the results of the Hausman test [43,44] indicated that the FE model was more suitable than the RE model. Following Frank [45], we also applied the impact threshold for a confounding variable (ITCV) method to check that the regression analysis was not biased by unobservable variables that could have been omitted in the modelling process [46,47,48]. The ITCV test indicated that the results were reasonably robust to control for potential endogeneity.

Subsequent tests were performed to validate the Gauss–Markov assumptions on autocorrelated errors and the presence of heteroscedasticity. The Wooldridge test [40] indicated the existence of autocorrelation and the Wald modified test revealed the presence of heteroscedasticity. According to Canarella and Gasparyan [49], estimates made using panel data often present problems of heteroscedasticity, serial autocorrelation and contemporaneous autocorrelation. These problems arise when errors are dependent on the cross-sections in the panel data model [50] but can be solved by applying the feasible generalised least squares (FGLS) technique.

However, Beck and Katz [51] demonstrated that FGLS produces standard errors that are seriously underestimated. Moreover, the authors describe Monte Carlo experiments in which the evaluation of panel-corrected standard errors (PCSE) allows the correction of the presence of serial autocorrelation, heteroscedasticity and even contemporary correlation with precise evaluations of standard error, with little or no loss of efficiency as compared with FGLS. In this sense, PCSE estimation method rather than FGLS is more efficient to correct problems of serial autocorrelation, heteroscedasticity and contemporaneous correlation. In addition, PCSE has the advantage that it can be used when the length of the time series is less than the number of observations, which is the case of the data selected in this study. Therefore, the results of the evaluations correspond to PCSE, which is represented in the following equation:

$$\boldsymbol{HD_{it}} = \beta_{0i} + \beta_1 IPE_{it} + \beta_2 OVER_{it} + \beta_3 EMP_{it} + \beta_4 EMI_{it} + \boldsymbol{e_{it}}$$

where i is the i-th transversal unit (country); t is the time (year); HDI is a variable measuring human development; IPE is a measure of involuntary part-time work; OVER measures the overcrowding rate; EMP measures the employment rate and EMI measures the per-centage of migrants in a given country.

5.3. Results

Table 8 summarises the descriptive statistics of the variables. The secondary information used to empirically test the proposed hypotheses is the 28 countries that constituted the European Union for the 13 years under study, specifically the period 2006–2018. The table also shows the results of the correlation estimations between the variables under study, which are consistent with the theory, thus providing initial evidence in support of the proposed hypotheses. As can be observed, there is a negative and significant correlation between the variables HDI and IPE. Similarly, the correlation between HDI and OVER is negative and significant.

Table 8. Descriptive statistics and correlation matrix

Variable	No	Mean	Std. Dev.	Min.	Max.	1	2	3	4
1. HDI	364	86.41	4.03	75.6	94.2	1			
2. IPE	364	29.52	17.59	5	72.6	−0.3535 ***	1		
3. OVER	364	20.70	17.26	1.4	60	−0.3595 ***	0.3219 ***	1	
4. EMP	364	69.89	5.87	52.9	82.4	0.1500 **	−0.5329 ***	−0.3970 ***	1
5. EMI	364	0.72	0.53	0.03	2.91	0.0974 *	−0.0085	−0.2132 ***	−0.0100

Source: Own elaboration. Note. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Figure 6 shows the spatial distribution of the average HDI and the involuntary part-time employment rate from 2006 to 2018 for the 28 countries of the European Union. As can be observed in the figure, countries with a high rate of involuntary part-time employment (dark blue shades), such as Romania, Bulgaria, the Czech Republic, Croatia, Cyprus, Poland and Portugal, also have a low HDI. Therefore, the information presented in the figure may provide initial evidence to support Hypothesis 1 of this paper, that is,

Figure 6. Spatial distribution of the average Human Development Index (HDI) (A) and of the involuntary part-time employment rate (B) in the EU countries. Source: Own elaboration based on Eurostat and UNDP data
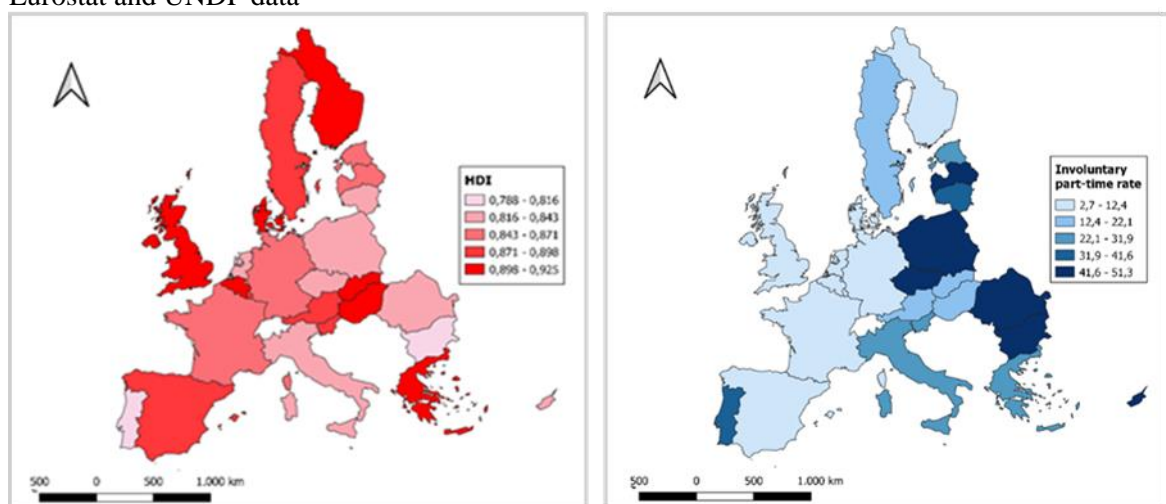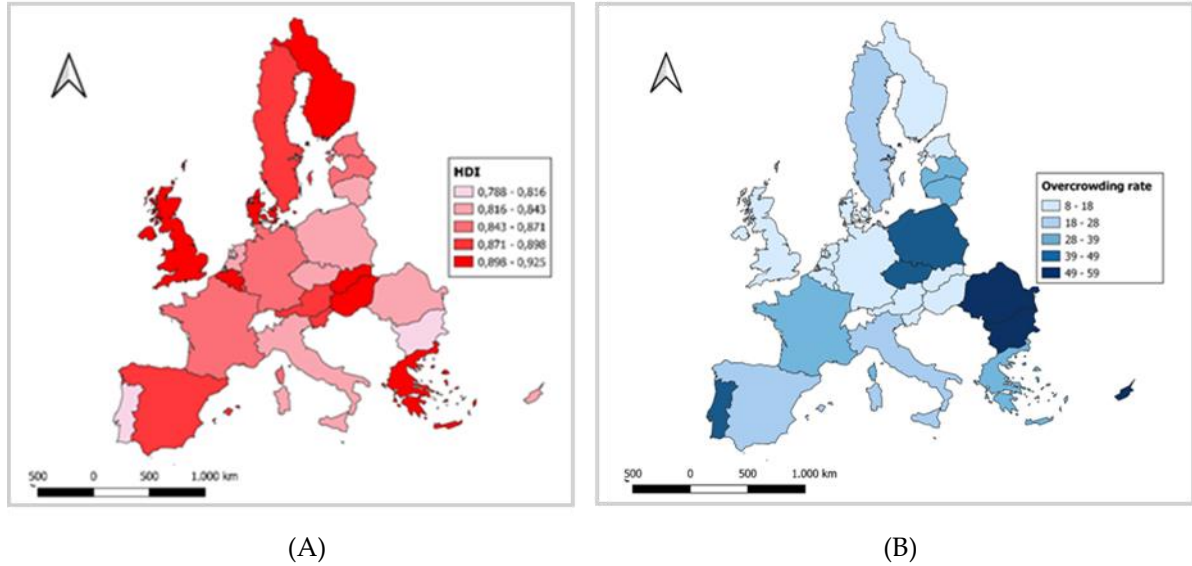

(A)

(B)

Figure 7 shows the spatial distribution of the average HDI and the overcrowding rate from 2006 to 2018 in the 28 countries. As can be seen, the countries with the highest over-

Figure 7. Spatial distribution of the average HDI (A) and of the overcrowding rate (B) in the EU countries. Source: Own elaboration based on EUROSTAT and UNDP data.

(A)   (B)

crowding rate (dark blue shades), such as Romania, Bulgaria, the Czech Republic, Cyprus, Poland and Portugal, also have a low HDI. Therefore, the information presented in this figure indicates the existence of the opposite relationship between OVER and HDI estab-lished in Hypothesis 2.

Table 9 summarises the results of the PCSE regressions (models 3 and 4). Model 4 has been estimated as a measure of the robustness of the results obtained in Model 3 due to the addition of dichotomous temporal (Year) and spatial (Country) variables, which are sig-nificant and should therefore remain in the estimate. Overall, Model 4 is significant at 99% ($\chi 2 = 1374$, $p < 0.0001$). Similarly, Model 4 shows that the relationship between IPE and human development in the countries of the European Union and over the period of time analysed is negative at a 95% confidence level. Additionally, OVER displays a negative relationship with human development at a 99% confidence level in the countries

of the European Union and over the time studied. Hence, Hypotheses 1 and 2 are validated.

Table 9. Regression analysis

Variable	Model 1 OLS-Pooled	Model 2 Fixed Efect	Model 3 PCSE	(Cor
		HDI		
IPE	0.08 ***	0.09 ***	−0.02 **	
	(0.01)	(0.01)	(0.01)	
OVER	–0.10 ***	–0.11 ***	−0.04 ***	
	(0.01)	(0.01)	(0.00)	
EMP	0.22 ***	0.23 ***	0.63 ***	
	(0.02)	(0.02)	(0.02)	
EMI	0.79 ***	0.74 ***	0.49 ***	
	(0.00)	(0.21)	(0.18)	
Time (Year) fixed effects				
Country fixed effects				
CONS	70.15 ***	69.34 ***	83.53***	
	(1.79)	(1.65)	(1.97)	
N	364	364	364	
Groups	28	28	28	
Chi2	357.41 ****		56.67 ****	
F Prob.		0.000 1		

Note. **** $p < 0.001$; *** $p < 0.01$; ** $p < 0.05$. Standard errors in parentheses.

As indicated in Section 2.3, to check that the results of the regression analysis shown in Table 9 are not affected by a possible correlated-omitted-variable bias, an ITCV test was carried out. According to the test, the higher the ITCV value, the less likely it is that the re-gression results will be affected by a possible bias due to the omission of explanatory var-iables. Table 10 shows the results of the ITCV test for the regression when the omitted vari-able is IPE. As can be seen, none of the impacts of the other variables included in the re-gression model are greater (in absolute value) than the absolute value of ITCV, which is 0.3489. Therefore, it is very unlikely that an omitted variable would have a higher correla-tion with the dependent variable HDI and with the independent variable IPE than any of the other correlated variables included in the model that would invalidate the result ob-tained for IPE. To ensure the robustness of the results to potential correlated-omitted vari-ables, the same analysis was also performed using the ITCV test when the omitted varia-ble is OVER (Table 11). As can be observed, the ITCV value is -0.4509, which is a greater absolute value than all the absolute values for the impact of the remaining non-dependent variables of the regression model. The conclusions obtained from the application of the ITCV test strongly support the conclusion that the regression results are not affected by problems of potential endogeneity.

5.4. Discussion

The negative and significant relationship between the variable IPE and the HDI indi-cates that human development in European Union countries decreases as the rate of in-voluntary part-time employment increases (Model 4). This result corroborates Hypothesis 1 of our work, which states that involuntary part-time work restricts the expansion of hu-man capabilities for people to lead the life they really want. Thus, employment quality is essential to value the action of working as a refined functioning insofar as it is chosen

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from among a set of possibilities [18–24]. In line with the theoretical approach of the HCA, involuntary part-time employment is not considered a refined functioning, since there is no other alternative but to choose this atypical employment; that is, there is no freedom to choose the achievement [31]. This underlines the importance of considering not only the quantity of employment in a given country in the analysis of human development, but al-so factors related to the quality of employment that allow us to determine the capabilities and functionings that individuals can generate [7].

Moreover, the negative and significant relationship between the variable OVER and HDI (Model 4) indicates that the HDI decreases as the rate of overcrowding increases in a country. This result corroborates Hypothesis 2, which states that when people live in overcrowded conditions, their capability to achieve their life goals is restricted. Thus, in line with the HCA, living in overcrowded housing adversely affects individuals' overall capabilities since it limits their basic instrumental freedoms, particularly protective security [50].

Finally, the variables EMP and EMI in Model 3 have a positive and significant effect on the HDI, thus indicating that an increase in both the employment rate and the percentage of migrants in a country increase the HDI. These results are in line with previous research that has shown a positive relationship between a country's economic development and an increase in labour market participation [52] as well as with studies that have found a link between the level of a country's well-being and higher migration to that country [51]. However, when Model 4 is estimated taking into account the temporal and spatial dimensions, it can be seen that these variables still have a positive impact on the HDI, but their coefficients are not statistically significant.

Table 10. Impact threshold for a confounding variable for the test of the association between IPE and HDI.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITCV	ITCV Implied Correlations	Cor(X,IPE)	Cor(X,HDI)	Impact	Cor(X,IPE)	Cor(X,HDI)	Impact$_{raw}$
IPE	0.3489	0.591						
OVER			0.1417	−0.3172	−0.45	0.3219	−0.3595	−0.1157
EMP			−0.4629	0.0111	−0.0051	−0.5329	0.1500	−0.0800
EMI			0.0158	0.0239	0.0004	−0.0085	0.0974	−0.0008

Source: Own elaboration. Notes: Table 3 shows the impact of the possible correlated-omitted variables on the results for the multivariate test of the association between the rate of involuntary part-time employment (IPE) and HDI. The results of the impact threshold for a confounding variable (ITCV) test are also shown. Column (1) indicates the ITCV, which is the lowest product of the partial correlation between the dependent variable HDI and the confounding variable and the partial correlation between the key independent variable IPE and the confounding variable that makes the IPE coefficient statistically insignificant. Column (2) indicates the implied minimum correlation that a confounding variable must have with the dependent variable HDI and with IPE to make the IPE coefficient statistically insignificant. Column (3) shows the partial correlations between IPE and each of the other independent variables of the regression model. Column (4) shows the partial correlations between the dependent variable HDI and each of the independent variables of the regression model (excluding IPE). Column (5) shows the partial impact of each independent variable (excluding IPE), which is obtained as the product of the two partial correlations shown in Columns (3) and (4). Column (6) shows the raw correlations between IPE and each of the other independent variables in the regression model. Column (7) shows the raw correlations between the dependent variable HDI and each of the independent variables of the regression model (excluding IPE). Column (8) shows the raw impact of each independent variable (excluding IPE), which is obtained as the product of the two raw correlations shown in Columns (6) and (7).

Table 11. Impact threshold for a confounding variable for the test of the association between OVER and HDI.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITCV	ITCV Implied Correlations	Cor(X,OVER)	Cor(X,HDI)	Impact	Cor(X,OVER)	Cor(X,HDI)	Impact$_{raw}$
OVER	−0.4509	0.672						
IPE			0.1417	−0.3269	−0.0463	0.3219	−0.3535	−0.1138
EMP			−0.2936	−0.0466	0.0137	−0.3970	0.1500	−0.0596
EMI			−0.238	0.1000	−0.0238	−0.2132	0.0974	−0.0208

Source: Own elaboration. Notes: The table shows the impact of the possible correlated-omitted variables on the results for the multivariate test of the association between overcrowding rate (OVER) and HDI. The results of the ITCV test are also shown. The interpretation of each of the columns in the table is analogous to that of the previous table but simply substituting the independent variable IPE for the variable OVE

5.5. Conclusions

In this study, we measured the impact of employment quality and housing quality on human development. Under the hypothesis that involuntary part-time work and living in overcrowded conditions restricts people's capabilities to achieve the life they want, we examined the effects of the percentage of involuntarily part-time workers and the overcrowding rate on the HDI. To this end, a panel data model was specified for the period 2006–2018 using information from the 28 countries of the European Union.

The findings of this work have important implications for the implementation of public policies aimed at improving people's well-being, since they highlight some key elements of employment and housing that directly influence a country's human devel-opment.

This study demonstrated the limitations of measures or indicators of human development. Although the HDI since 1990 was calculated and provides a long series of observations, the index covers only three dimensions of quality of life. To address this issue, the results could have been compared with other quality of life indicators, such as the Social Progress Index (SPI). However, we were unable to use the SPI because it does not yet have a time series that is suitable for this type of study.

Taking into account this limitation, future lines of research could focus on the development of measures or synthetic indexes of quality of life based on indicators with historical series. This would enable us to further examine the impact of involuntary part-time work and overcrowding on people's quality of life using indicators beyond those measured by the HDI.

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Capítulo 6:
Reflexiones finales

Capítulo 6. Reflexiones Finales

El presente trabajo analiza las desigualdades de género en el mercado de laboral atendiendo a la cantidad y a la calidad del empleo desde un enfoque econométrico espacial. Hay escasos estudios que analicen las tasas de empleo masculina y femenina y los factores socioeconómicos y laborales que inciden sobre estas tasas desde una perspectiva espacial. Por esto, en el Capítulo 2 de esta investigación se han formulado 4 hipótesis. Las hipótesis se han probado en la sección de resultados de cada una de las publicaciones aportadas para la modalidad de compendio de artículos insertados en los capítulos 3, 4 y 5 de la tesis doctoral.

Así, en primer lugar, se ha demostrado que la distribución espacial de la brecha de género en el empleo en los municipios andaluces y la distribución espacial de las regiones que cumplen con el objetivo del empleo femenino y masculino propuesto por *Europa2020* no es aleatoria, sino que se distribuyen formando conglomerados espaciales (*hipótesis 1*). Los mapas de coropletas realizados muestran una fuerte concentración espacial en las variables estudiadas. Esta concentración puede ser un indicador de la existencia de autocorrelación espacial en las variables analizadas, por ello se realizaron las pruebas de la I de Moran y el test Joint Count. A través de estas pruebas se detectó la presencia de autocorrelación espacial, lo que confirmaba los resultados obtenidos en los mapas y, además, lo que corrobora la *hipótesis 1* de nuestro estudio. Estos resultados están en línea con la literatura que establece que el contexto geográfico configura las relaciones laborales que pueden darse en un territorio (Hudson, 2001; McGrath-Champ et al., 2010). La existencia de características comunes entre las regiones que se encuentran cercanas en el espacio condiciona la naturaleza del empleo y las relaciones laborales que se desarrollan en ese territorio (Rainnie et al., 2011,). Estos hallazgos tienen fuertes

implicaciones políticas ya que visibilizan la importancia de tener en cuenta las especificidades regionales del contexto geográfico analizado. Esto es que, a la hora de aplicar políticas públicas de empleo en un espacio determinado, se adopte un enfoque territorial (Budd, 2013; Solly, 2016).

En segundo lugar, se ha evidenciado que la brecha de género en el empleo en un municipio y la probabilidad de que una región cumpla los objetivos de empleo femenino y masculino de *Europa2020* están influenciadas por lo que ocurre en las regiones vecinas *(hipótesis 2)*. A partir de los modelos econométricos espaciales realizados se ha demostrado la existencia de interacciones espaciales en las variables objeto del análisis entre los 727 municipios andaluces y las 270 regiones europeas, lo que corrobora la *hipótesis 2* del trabajo. Estos resultados están en línea con los aportes de Ruiz-Villaverde et al. (2018), que verifican que los gobiernos regionales no se encuentran aislados geográficamente en la adopción de determinadas políticas públicas. Así, las interacciones espaciales que se producen en las regiones en la brecha de género y en el logro del objetivo de *Europa2020* están provocadas por los mecanismos de difusión de políticas, tales como los mecanismos de imitación, competencia y aprendizaje (Shipan y Volden, 2008). Estos hallazgos también tienen importantes implicaciones para los organismos públicos ya que respalda de nuevo la adopción de un enfoque territorial a la hora de implementar una política pública de empleo en una región, debido al impacto significativo que puede tener la adopción de dicha política sobre las regiones vecinas (Niebuhr, 2003). En otras palabras, estos resultados dan cuenta de la existencia de un "efecto dominó" entre las regiones próximas en el espacio como consecuencia de los mecanismos de difusión, de forma que lo que ocurre en una región se ve fuertemente influenciada por lo que ocurre en las regiones vecinas.

En tercer lugar, a través de los modelos econométricos realizados también se ha evidenciado que determinados factores laborales y socioeconómicos influyen en una reducción de la brecha de género en el empleo y en la probabilidad de que las regiones cumplan los objetivos de empleo masculino y femenino de *Europa2020 (hipótesis 3)*. Así, factores como la tasa de dependencia, la tasa de fertilidad, el GPD o el ingreso per cápita, el nivel educativo y el porcentaje de especialización en el sector servicios, entre otros, tienen una relación directa sobre la brecha de género en el empleo o sobre la tasa de empleo masculina y femenina, lo que corrobora la *hipótesis 3* de este trabajo. Estos resultados están en línea con la literatura económica feminista que evidencia el negativo efecto de las responsabilidades familiares y domésticas sobre la inserción laboral femenina (Rodríguez, 2010; Carrasco, 2006; Cukrowska-Torzewska, 2016; Cutillo y Centra, 2017). Efectivamente, la cantidad de trabajo doméstico y de cuidados aumenta exponencialmente con la presencia de personas dependientes (Moen y Yu, 2000). Como son las mujeres las que brindan la mayor parte de esta atención, su incorporación al mercado de laboral suele producirse en condiciones más desfavorables (Mayordomo y Dominguez, 2006). Por otro lado, también estos resultados avalan aquellos estudios que evidencian que la estructura sectorial, el nivel socioeconómico de una región o las tasas de escolarización de la población, pueden tener un impacto sobre el nivel de empleo femenino y masculino y, por ende, sobre la brecha de género (Castellano y Rocca, 2019; Noback et al., 2013). Esta información releva la importancia de realizar análisis diferenciando por género en el estudio del mercado laboral ya que existen diversos factores que tienen un mayor impacto sobre el empleo femenino que sobre el masculino. Además, también los resultados dan una información muy relevante a las administraciones sobre cuáles son los factores y en qué medida influyen en las tasas de

empleo, en aras de orientar los esfuerzos de las políticas públicas precisamente hacia dichos factores.

Por último, a través de la realización de un modelo econométrico de datos de panel para el período 2006-2018 en 28 países de la Unión Europea, se ha corroborado que la calidad en el empleo, medida a través del trabajo a tiempo parcial involuntario, tiene un impacto negativo sobre el desarrollo humano (*hipótesis 4*). En línea con los aportes de la teoría del desarrollo humano, el trabajo a tiempo parcial involuntario restringe la expansión de las capacidades humanas para que las personas lleven la vida que realmente desean en tanto que no hay libertad de elección y se lleva a cabo por obligación (Sen, 1999, Anand et al.,2009; Alkire, 2005). Además, en trabajos como los de Pavlopoulos et al. (2014) o Filandri y Struffolino (2019) se ha utilizado este tipo de trabajo como indicador principal de la calidad del empleo dando cuenta de la relación directa entre este tipo de empleo y la pobreza laboral de los trabajadores. Este hallazgo visibiliza la necesidad de incorporar factores relacionados con la calidad del empleo en el análisis del mercado laboral, de forma que tome en cuenta no sólo la cantidad de empleo sino las características del trabajo en cuestión. Así, si bien alcanzar una determinada tasa de empleo femenino y masculina puede tener efectos positivos para el bienestar de la población, debemos de incorporar al análisis el enfoque del desarrollo humano ya que visibiliza las verdaderas capacidades y funcionamientos que genera el empleo para que las personas alcancen sus metas de vida (Sehnbruch, 2004; UNPD, 2015).

En definitiva, las decisiones estratégicas que deben tomar las instituciones públicas para abordar con éxito el problema del desempleo y las brechas de género en el mercado laboral, pueden ser respaldadas por los resultados que se presentan en este estudio. Así, las principales contribuciones que se extraen de esta tesis doctoral son:

1. Primero, la necesidad de llevar acabo un análisis con perspectiva de género, que tenga en cuenta que aún existen fuertes diferencias por género en el mercado laboral. Entender el vínculo entre las relaciones de género y el mercado de trabajo, es imprescindible para comprender la dinámica económica y reconocer los factores determinantes de estas desigualdades.

2. Segundo, la importancia de aplicar una visión territorial en el análisis del mercado laboral que tome en consideración las características regionales del contexto geográfico y el posible efecto de contagio que existe entre las regiones que se encuentran próximas en el espacio.

3. Tercero, el interés de analizar el empleo desde el enfoque del desarrollo humano de forma que se tome en cuenta, además de la cantidad de empleo, la calidad del empleo medido a través de las características que tiene el trabajo las cuales influyen directamente sobre el bienestar de la población.

Algunas de las limitaciones con las que nos hemos encontrado a la hora de llevar a cabo esta investigación son las enumeradas a continuación:

a) No hay suficiente información estadística desglosada por género lo que problematiza los análisis diferenciando entre mujeres y hombres en el ámbito laboral y socioeconómico.

b) Hay determinados indicadores de género que no están disponibles para diferentes escalas regionales lo que dificulta la adopción de un enfoque territorial.

c) No hay disponibilidad de indicadores suficientes en la medición de las características cualitativas del trabajo, lo que obstaculiza el análisis de la calidad del empleo.

Por tanto, el trabajo de investigación desarrollado en esta tesis doctoral ha permitido despejar algunas incógnitas sobre las relaciones de género y las dinámicas laborales que se producen en el mercado de trabajo. Pero también, ha generado nuevas ideas, nuevos retos y ha abierto nuevas líneas de trabajo. Así, se propone continuar la presente investigación teniendo en cuenta las contribuciones planteadas en este trabajo de una manera transversal, es decir, considerando los tres aspectos propuestos de forma conjunta en el análisis del mercado laboral. Una primera línea de trabajo sería abordar la calidad del empleo a través de indicadores desglosados por género, esto es, a través de indicadores que diferencien entre hombres y mujeres a la hora de analizar las características cualitativas del trabajo. Una segunda línea, y otro paso más en el análisis, sería tomar como muestra unidades territoriales a nivel regional, esto es, adoptar un enfoque territorial en el análisis de las características del trabajo para el caso masculino y femenino.

Con este conjunto de reflexiones finalizamos el presente estudio, esperando que las cuestiones planteadas caminen en la conformación de una visión mucho más completa de las desigualdades de género en el mercado laboral y del comportamiento de los patrones de empleo en las distintas regiones.

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[2] En esta sección se incluye la bibliografía citada en el Capítulo 1, 2 y 6 del trabajo (introducción, objetivos y metodología, y conclusiones). Las referencias correspondientes a las publicaciones científicas se encuentran incluidas en los capítulos respectivos (Capítulo 3, 4 y 5), en línea con la estructura requerida para esta modalidad de tesis doctoral.

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