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**Essays on Monetary Policy and Financial
Markets: Implications for Income Inequality**

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Y para que así conste y tenga los efectos oportunos, en Málaga a 9 de noviembre de 2023.

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SE INFORMA:

Que la tesis doctoral está avalada por dos artículos científicos, dos *working papers* y un capítulo de libro:

1. El primer capítulo, "Rethinking Monetary Policy in the Framework of Inclusive and Sustainable Growth", ha sido publicado en el libro *Economic Policies for Sustainability and Resilience*: Pérez-Moreno, S., Martín Fuentes, N., & Juan-Francisco Albert (2021). Rethinking Monetary Policy in the Framework of Inclusive and Sustainable Growth. *Economic Policies for Sustainability and Resilience* (Editorial Palgrave Macmillan), 319-364. DOI: https://doi.org/10.1007/978-3-030-84288-8_8
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Bárcena-Martín, E., Martín-Fuentes, N., & Pérez-Moreno, S (2023). Who Takes the Cake? The Heterogeneous Effect of ECB Accommodative Monetary Policy across Income Classes. ECINEQ, Working Papers Series 657, Society for the Study of Economic Inequality.
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4. El cuarto capítulo, “A Deep Dive into the Capital Channel of Risk Sharing in the Euro Area”, está publicado como Documento de Trabajo del Banco Central Europeo bajo la siguiente referencia:

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Y para que así conste y tenga los efectos oportunos, en Málaga a 9 de noviembre de 2023.

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A mi equipo: mis padres y mis abuelos.

*Por hacer posible este texto:
el resultado de tres generaciones.*

“De niño, mi abuelo trabajó en el campo.

Pero cuando él salió del campo, nos sacó de allí a todos”



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Resumen

La lucha contra las desigualdades económicas y la crisis climática son elementos fundamentales para el logro de un crecimiento económico inclusivo y sostenible que permita progresar hacia la consecución de los Objetivos de Desarrollo Sostenibles (ODS). En lo que concierne a la desigualdad, desde la década de los ochenta, numerosas economías avanzadas han experimentado una tendencia hacia sociedades menos equitativas. En el caso de Europa, varias instituciones han evidenciado un aumento gradual en la concentración de los ingresos, observable para distintas definiciones de ingreso (bruto y neto) y en distintas fuentes de datos. La Base de Datos Mundial sobre Desigualdad documenta que, entre 1980 y 2000, el ingreso recibido por el 10% más rico de la población creció, por término medio, un 2% cada año. Sin embargo, la renta percibida por la mitad menos pudiente de la población apenas creció a una tasa media del 0.3-0.5% anual. La Crisis Financiera Global aceleró esta tendencia, exacerbando aún más las diferencias socioeconómicas entre los distintos estratos poblacionales. Según Eurostat, la tasa de desempleo de la zona euro aumentó desde el 7.3% en marzo de 2008 hasta un máximo del 12.2% en abril de 2013, periodo durante el cual el número de desempleados se incrementó en alrededor de 5.5 millones de personas. Sin embargo, el peso de la recesión se distribuyó de forma heterogénea entre las distintas clases de renta, recayendo un impacto mayor sobre los hogares con ingresos modestos y agravando así la desigualdad. Concretamente, las pérdidas de empleo se concentraron principalmente entre los trabajadores poco cualificados, así como entre aquellos más jóvenes, los cuales tienden a ubicarse en el lado izquierdo de la distribución de la renta.

El comportamiento procíclico de la desigualdad en términos de renta es un fenómeno común a la mayoría de las recesiones, y está intrínsecamente relacionado con las dinámicas propias de los mercados laborales. Durante las recesiones, los trabajadores de bajos ingresos suelen tener una mayor probabilidad de ser despedidos, mientras que la situación laboral de los trabajadores más acomodados se comporta de forma más resiliente ante fluctuaciones macroeconómicas. Los hogares más ricos no sólo disfrutaban de una menor probabilidad de perder sus empleos, sino que también tienden a poseer una distribución de sus ingresos más diversificada, en la que los ingresos del capital desempeñan un papel más importante y pueden compensar parcialmente la potencial disminución temporal de los ingresos laborales. En este sentido, el Banco Mundial revela que la contribución de los ingresos laborales a la desigualdad total de los ingresos supera el 70% en la mayoría de los países europeos, revelando así que el salario ayuda a explicar la mayor parte de las fluctuaciones en la desigualdad de los ingresos durante los últimos años.

Tras la recesión, el desempleo de la zona euro se mantuvo muy por encima de los niveles anteriores durante más de una década, y no fue hasta finales de 2019 cuando la tasa de desempleo disminuyó hasta el 7.5% (solo 0.2 puntos porcentuales superior al mínimo anterior). No sólo la crisis afectó más a aquellos más vulnerables, sino que la recuperación del empleo también se distribuyó de forma heterogénea: los hogares más pobres quedaron rezagados respecto del resto de la población, y muchos sufrieron, en gran medida, una recuperación incompleta. En términos reales, los ingresos laborales de los trabajadores poco cualificados, así como de los jóvenes recién incorporados a mercado laboral se mantenían en niveles inferiores incluso una década después de la crisis. Lamentablemente, la recuperación no logró que la desigualdad de ingresos revirtiese completamente a su nivel anterior. Este episodio evidencia que los períodos prolongados de desempleo elevando no solo generan fluctuaciones cíclicas en la desigualdad de los ingresos, sino que también pueden dañar las perspectivas laborales futuras de los desempleados dejando así heridas duraderas, también conocidas como “efecto histéresis”.

El aumento progresivo en la desigualdad de la renta, así como el deterioro de la clase media ha situado las cuestiones de la distribución del ingreso, el crecimiento inclusivo y las implicaciones distributivas de las políticas macroeconómicas en la vanguardia del análisis económico. En el ámbito de la investigación económica, han sido y continúan siendo innumerables los esfuerzos realizados para comprender las causas subyacentes, así como para proponer políticas públicas que permitan revertir esta situación. A la hora de explicar el origen, la literatura académica ha identificado diversas tendencias seculares que explican, en gran medida, el aumento estructural de la desigualdad. La globalización, el progreso tecnológico, las tendencias demográficas, los cambios en las instituciones del mercado laboral o la capacidad limitada de los sistemas del bienestar para promover la equidad son algunos de los factores más notables. Desde el ámbito de la política pública, la existencia del “efecto histéresis” implica que las políticas de estabilización macroeconómicas no sólo están justificadas por el componente cíclico de la producción y el desempleo, sino que también puede beneficiar a la desigualdad en el largo plazo. Limitar la gravedad y la duración de los períodos recesivos pueden también disminuir el riesgo de que la desigualdad cíclica se vuelva estructural.

De forma paralela, durante las últimas décadas se ha incrementado la preocupación y conciencia social acerca del cambio climático y la degradación medioambiental, y la contribución antropogénica a estos fenómenos, cuyo potencial para generar desastres

naturales severos es cada vez más notable. Hoy día, de acuerdo con los ODS y la Agenda 2030, la satisfacción de las necesidades de las generaciones presentes sin comprometer la capacidad de las generaciones futuras para satisfacer sus necesidades se debería situar como un objetivo central de las políticas públicas. Esta integración de las equidades intra- e intergeneracional conforman lo que podríamos denominar el actual paradigma del crecimiento inclusivo sostenible. En términos de política económica, en la búsqueda de un crecimiento inclusivo sostenible, la primera línea de defensa ante las elevadas desigualdades y el deterioro medioambiental suele ser la política fiscal y las iniciativas de carácter regulatorio. Estas intervenciones permiten generar cambios sobre las variables de interés de forma más directa, precisa y ágil, en la medida en que estas pueden ser definidas ad-hoc para la consecución de objetivos concretos distributivos o medioambientales. Esta realidad difiere considerablemente cuando se trata de política monetaria, siendo su objetivo principal preservar la estabilidad de precios y cuyos efectos sobre el crecimiento inclusivo sostenible tienen a ser indirectos, de menor magnitud, generalmente involuntarios, y circunscritos a una realidad socioeconómica e institucional concreta.

La política monetaria puede desempeñar un papel central en la estabilización de las fluctuaciones cíclicas a nivel macroeconómico y, como consecuencia, limitar los aumentos del desempleo durante las crisis económicas. Mediante el cumplimiento de su objetivo de estabilidad de precios a medio plazo, la política monetaria también puede ayudar a respaldar la actividad económica durante las recesiones. Este apoyo favorece en especial a aquellos hogares más vulnerables, los cuáles son más propensos a verse afectados por deterioros en el empleo. Antes de la Crisis Financiera Global, el consenso compartido por académicos y banqueros centrales sugería que la política monetaria no era un factor clave en el aumento de la desigualdad, ya que “la política monetaria es neutral o casi neutral en el largo plazo, lo que significa que tiene efectos limitados en variables reales tales como la distribución de la renta y la riqueza” (Bernanke, 2015). Sin embargo, más recientemente, esta visión tradicional que propone la neutralidad de la política monetaria a lo largo del ciclo económico está perdiendo terreno frente a la noción de que el componente cíclico y la tendencia rara vez son independientes. En este sentido, la idea de “histéresis” de la desigualdad implica que una política monetaria exitosa capaz de reducir la gravedad y la duración de las recesiones podría limitar los aumentos excesivos del desempleo, apoyando así la equidad y el crecimiento también en el largo plazo.

Tras la crisis financiera global de 2008, la magnitud de la recesión en la zona euro llevó al Banco Central Europeo (BCE) a utilizar las distintas herramientas de política monetaria a su disposición, introduciendo también importantes innovaciones en su marco operativo y de comunicación. Las medidas “convencionales” de política monetaria consistentes en ajustar los tipos de interés oficiales para así orientar los mercados monetarios no pudieron mantener su efecto expansivo una vez los tipos oficiales cayeron en territorio negativo. Ante esta situación, para fomentar la transmisión de la política monetaria hacia los tipos de interés a largo plazo que rigen las condiciones de financiación en la economía real, el BCE desplegó una serie de herramientas de política monetaria de carácter “no convencional” (indicaciones sobre la orientación futura de la política monetaria *-forward guidance-*, compras de activos financieros *-Quantitative Easing (QE)-*, y tipos de interés negativos). La implementación de estas políticas no convencionales, que pueden ejercer un efecto más directo y de mayor calado sobre los mercados financieros, han puesto en duda la idea de *neutralidad* a largo plazo de la política monetaria y han avivado el debate sobre sus posibles efectos secundarios. En el ámbito de la desigualdad, más allá de la esfera académica, los efectos potenciales de estas políticas monetarias ultra-expansivas han sido abordados por numerosos banqueros centrales y, durante la última década, se ha observado un aumento exponencial en la proporción de discursos en los que los banqueros centrales mencionan la desigualdad. Asimismo, existe igualmente una sensibilidad creciente en torno a la sostenibilidad ambiental y las posibilidades de la política monetaria en la lucha contra el cambio climático, si bien esta línea de trabajo se encuentra en un estadio más incipiente. En ambos casos, la investigación apunta a la existencia de una relación de causalidad bidireccional entre desigualdad y crisis climática, y política monetaria, tal que esta no sólo puede ejercer cierta influencia sobre ambos ámbitos, sino que también se ve afectada por ellos.

En este contexto, la primera parte de esta tesis doctoral, la cual engloba los capítulos primero, segundo y tercero, tiene como objetivo general analizar las posibles implicaciones distributivas de las herramientas de política monetaria implementadas por el BCE tras el inicio de la Crisis Financiera Global en 2008 y hasta el comienzo de la pandemia de COVID-19. El primer capítulo examina los diversos canales teóricos a través de los cuáles la política monetaria puede afectar a la equidad, atendiendo tanto al ámbito de la desigualdad de la renta y la riqueza como a los aspectos climáticos, claves en el estudio de la desigualdad intergeneracional. Los capítulos segundo y tercero profundizan empíricamente en las posibles implicaciones para la distribución de la renta, poniendo el foco en el mecanismo principal a

través del cual la política monetaria afecta a la desigualdad de la renta: el mercado laboral. Si bien la equidad es inevitablemente una cuestión de segundo orden para la política monetaria, cuyo mandato principal es la estabilidad de precios, esta investigación pretende analizar sus efectos durante los últimos años para así ayudar a diseñar la política monetaria a la luz de los desafíos de nuestros tiempos.

En concreto, los objetivos específicos de los tres primeros capítulos de esta investigación son los siguientes:

- En primer lugar, abordar las implicaciones distributivas y medioambientales del marco contextual actual de la política monetaria. De este modo, se ofrece una revisión del marco teórico y conceptual que vincula la política monetaria con el paradigma de crecimiento inclusivo y sostenible.
- En segundo lugar, estudiar el impacto distributivo de la política monetaria llevada a cabo por el BCE desde la Crisis Financiera Global y hasta el inicio de la pandemia de COVID-19. Concretamente, esta investigación analiza cómo la política monetaria expansiva tuvo un efecto heterogéneo sobre las distintas clases socioeconómicas, poniendo el foco en los diversos canales de transmisión que tienen su efecto mediante el mercado laboral.
- En tercer lugar, analizar empíricamente en qué medida esta política monetaria empleada por el BCE ejerció un impacto distintivo sobre la movilidad de las distintas clases socioeconómicas a lo largo de la distribución de la renta.

Concretamente, el primer capítulo, *“Rethinking Monetary policy in the framework of inclusive and sustainable growth”*, parte de la observación de que el crecimiento socialmente inclusivo y sostenible en términos medioambientales es una prioridad central de las políticas públicas de la mayoría de los gobiernos europeos. En este contexto, la política monetaria es una poderosa herramienta de política macroeconómica relacionada tanto con cuestiones distributivas como medioambientales, con numerosos mecanismos de transmisión que configuran un vínculo bidireccional entre ambas. Tras la introducción, este estudio profundiza en los marcos teóricos y conceptuales del crecimiento inclusivo y sostenible, destacando los distintos paradigmas que se han sucedido en las últimas décadas. A continuación, se profundiza en los dos elementos centrales del crecimiento integrador y sostenible, a saber, las preocupaciones distributivas y medioambientales, y se explica cómo han saltado recientemente al primer plano del debate político y social. La cuarta sección analiza los vínculos entre la política monetaria y la desigualdad económica. Por un lado, se

ofrece una revisión sistemática de los distintos canales de transmisión a través de los cuales las decisiones de política monetaria podrían afectar a la desigualdad de la renta y de la riqueza, y se presentan las principales conclusiones y los retos a los que se enfrenta la literatura para abordar empíricamente estos vínculos. Por otro lado, se examina el vínculo causal opuesto, es decir, se aborda hasta qué punto el aumento de las desigualdades podría acarrear consecuencias para el funcionamiento de la política monetaria y su eficacia final. La quinta sección se centra en el tema de la sostenibilidad medioambiental, profundizando en (i) cómo podrían incorporarse estos aspectos en el marco actual de política monetaria, (ii) cuáles son las implicaciones de los riesgos físicos y de transición relacionados con el clima para los responsables de la política monetaria, y (iii) cuál podría ser el papel de la política monetaria en la lucha contra el cambio climático. El capítulo concluye con algunas propuestas para el diseño de la política monetaria ante los retos distributivos y medioambientales.

Este capítulo de libro, de naturaleza puramente cualitativa, ofrece una amplia revisión bibliográfica que examina los principales debates en curso sobre los vínculos entre la política monetaria y los retos asociados a la desigualdad y el cambio climático. Se observa que las investigaciones realizadas hasta la fecha apuntan a la existencia de vínculos de causalidad bidireccionales y confirman que la política monetaria parece ejercer cierta influencia en la desigualdad de ingresos y riqueza y en la sostenibilidad medioambiental. Asimismo, la investigación reciente señala que la aplicación de la política monetaria también se ve afectada por aspectos distributivos y medioambientales. Este capítulo pone de relieve la importancia no sólo del ritmo, sino también del patrón de crecimiento en términos de equidad y sostenibilidad medioambiental. Esto realza la necesidad de identificar y aplicar políticas nacionales específicas para transitar hacia vías de crecimiento más integradoras y sostenibles, y así evitar que el crecimiento económico pueda producirse a expensas de los grupos de población más desfavorecidos o genere problemas medioambientales.

Si bien el crecimiento inclusivo y sostenible requiere enfoques integrales basados en una amplia gama de políticas públicas, parece claro que la política monetaria tiene importantes implicaciones en la coyuntura actual. Este capítulo explora los vínculos entre la política monetaria y tanto la desigualdad económica como las preocupaciones medioambientales y revela que muchos estudios sostienen que las políticas monetarias no son neutrales para la desigualdad económica y los riesgos medioambientales. Más allá de los aspectos éticos sobre si la política monetaria debe tener en cuenta los retos distributivos y medioambientales en su toma de decisiones, nuestro análisis aporta numerosos argumentos

a favor de que la política monetaria preste una mayor atención a la desigualdad de ingresos y riqueza, así como a la degradación medioambiental y el cambio climático. Repensar la política monetaria en términos de equidad intra- e intergeneracional no sólo parece necesario, sino también esencial para contribuir al cumplimiento de los ODS, y como tal debe ser considerado seriamente por los académicos y los responsables de la política monetaria.

El segundo capítulo de esta tesis doctoral se titula *“Who takes the cake? The heterogeneous effect of ECB accommodative monetary policy across income classes”*. Este trabajo se centra en el conjunto de países que originaron la Unión Económica y Monetaria (UEM-11) y proporciona evidencia sobre el modo en que la política monetaria del BCE afectó a las distintas clases de renta a través del mercado de trabajo durante el período comprendido entre 2006 y 2019. Más concretamente, este análisis hace uso de datos de nivel micro procedentes de las Estadísticas Europeas sobre la Renta y las Condiciones de Vida (EU-SILC) para estimar la desigual incidencia de la política monetaria sobre la situación laboral (también conocido como margen extensivo) y los salarios (el margen intensivo) entre las distintas clases de renta. Además, arroja luz sobre las implicaciones concretas a través del margen extensivo desentrañando el impacto sobre el riesgo de pérdida de empleo (es decir, la tasa de separación del empleo) y sobre la probabilidad de encontrar un empleo (es decir, la tasa de búsqueda de empleo). Entre los distintos mecanismos de transmisión de la política monetaria, el marco teórico de la investigación se centra en los dos canales principales que operan a través del mercado de trabajo y afectan a la desigualdad de la renta: el canal de la composición de la renta y el canal de la heterogeneidad de los ingresos. La revisión de la literatura pone de relieve que los análisis previos han arrojado resultados a veces divergentes, lo que revela que el impacto de la política monetaria sobre la desigualdad de ingresos debe abordarse empíricamente en cada caso concreto.

Si bien la visión tradicional afirma que la política monetaria es neutral o casi neutral a lo largo del ciclo económico, la literatura reciente revela que los cambios cíclicos y tendenciales casi nunca son independientes. Los datos utilizados en esta investigación sugieren la existencia de efectos persistentes en el mercado laboral. Por un lado, en lo que respecta a la tasa de desempleo, observamos que los trabajadores situados en la parte más a la izquierda de la distribución de la renta fueron tanto los primeros en salir del mercado laboral (ya en 2008) como los últimos en reincorporarse al mismo durante la recuperación (solo en 2017). Además, estos hogares sufrieron el mayor aumento de la tasa de desempleo. Cuando se examina el ciclo económico completo, incluyendo también la recuperación total hasta 2019, se

observa que el deterioro cíclico sufrido desproporcionadamente por la clase baja no se invierte totalmente, ya que el desempleo posterior a la crisis se mantiene por encima de las cifras anteriores a la crisis, lo que provoca efectos persistentes o de histéresis. Por otra parte, los ingresos laborales reales mostraron un comportamiento diferente por clases de renta. En particular, el crecimiento salarial disminuyó y luego se estancó durante un largo período de tiempo, y se mantuvo en torno al 5-10% por debajo de los niveles anteriores a la crisis durante siete años consecutivos (solo comenzó a recuperarse en 2016). Tanto el deterioro como la recuperación fueron más positivos para el resto de las clases de renta. En consecuencia, la ampliación de la dispersión salarial observada durante la recesión no se invirtió por completo tras la fase de recuperación, y parte de ella aún permanecía en 2019.

En este contexto, esta investigación analiza el impacto heterogéneo de la política monetaria del BCE en las distintas clases de renta de la zona del euro a través del mercado de trabajo. Las métricas del mercado de trabajo específicas de cada clase se calculan utilizando datos de encuestas de hogares de las Estadísticas Europeas sobre la Renta y las Condiciones de Vida (EU-SILC), que constituyen la fuente de referencia para las estadísticas comparativas sobre la distribución de la renta en Europa. Los análisis macroeconómicos y las evaluaciones de políticas requieren considerar las interdependencias entre las distintas variables económicas, con el fin de evaluar los impactos desde una perspectiva global y descubrir relaciones causales. La existencia de interacciones entre las variables analizadas constituye la principal razón por la que un sistema de ecuaciones simultáneas parece ser una forma acertada de enfocar nuestro análisis. Por lo tanto, el principal enfoque empírico utilizado en esta investigación es la estimación de modelos de autorregresión vectorial (VAR) para cada uno de los países que componen el análisis. Asimismo, se produce una serie de comprobaciones de robustez utilizando un conjunto de modelos de proyección local (LP), utilizando datos en forma panel.

El principal hallazgo de esta investigación reside en la reacción heterogénea de la tasa de desempleo de las distintas clases de renta ante shocks de política monetaria expansiva. En particular, la clase baja muestra la reacción de mayor magnitud y, por tanto, se beneficia del descenso más acusado de la tasa de desempleo. La magnitud del impacto se reduce a medida que nos desplazamos hacia el extremo derecho de la distribución de la renta, siendo más moderado tanto para la clase media-baja como para la media-alta, mientras que la tasa de desempleo de la clase alta no parece verse afectada de forma significativa. Esto revela que la mayor actividad económica promovida por la política monetaria expansiva se materializó en

más oportunidades de empleo que parecen haberse distribuido de forma desigual entre las clases de renta, favoreciendo especialmente a los hogares más vulnerables. Por lo tanto, durante el pasado ciclo económico, la política monetaria expansiva parece haber contribuido a contener la desigualdad de ingresos a través del margen extensivo (es decir, las oportunidades de empleo) del mercado laboral.

Respecto al salario, se observa que la reacción de las rentas del trabajo reales a los shocks de relajación monetaria también difiere para las distintas clases de renta. Concretamente, las rentas del trabajo obtenidas por la clase baja parecen no haberse visto afectadas significativamente por las políticas de flexibilización monetaria. Por su parte, las clases medias sí parecen beneficiarse de un efecto positivo sobre sus salarios, si bien el impacto es bastante moderado y aparece con un desfase de entre ocho y doce trimestres. Esto contrasta con la dinámica mostrada por la clase alta, para la que el impacto es mayor y se materializa antes en el tiempo, entre tres y ocho trimestres después del shock. Estos resultados sugieren que la política monetaria expansiva podría haber exacerbado la desigualdad de ingresos a través del margen intensivo (es decir, los salarios), ya que los hogares más acomodados disfrutaron de un efecto positivo de mayor magnitud, mientras que los salarios devengados por los hogares de bajos ingresos parecen no haberse visto afectados por la política monetaria expansiva.

Este análisis pone de relieve que la política monetaria expansiva parece haber reducido la desigualdad de ingresos a través del margen extensivo (es decir, la tasa de desempleo) del mercado laboral, mientras que ha aumentado las disparidades entre las clases de ingresos a través del margen intensivo (es decir, los salarios). Al examinar el impacto total, observamos que predomina ampliamente el efecto reductor de la desigualdad del margen extensivo. En un segundo análisis, esta investigación da un paso más y trata de entender hasta qué punto este efecto de disminución de la desigualdad se debe a la reacción de la tasa de separación del empleo (es decir, las personas empleadas tienen menos probabilidades de perder su empleo) o más bien está relacionado con la tasa de búsqueda de empleo (es decir, las personas desempleadas tienen más probabilidades de encontrar un empleo). Este análisis confirma que la situación laboral de los trabajadores más pobres es sustancialmente más elástica a las perturbaciones de política monetaria, y que el impacto diferencial entre clases de renta se debe en gran medida a una mejora sustancialmente mayor de las tasas de búsqueda de empleo para los que se sitúan en la parte inferior de la distribución de la renta. Por el contrario, el impacto

positivo de la relajación monetaria sobre las tasas de separación del empleo ha sido bastante homogéneo en toda la distribución.

Esta investigación concluye que la política monetaria expansiva ha contribuido a reducir la desigualdad de las rentas del trabajo, ya que el impacto positivo a través del margen extensivo (es decir, la mejora de las oportunidades laborales de los más pobres) ha compensado en gran medida el aumento comparativamente menor de la desigualdad impulsado por el margen intensivo (es decir, la mejora de los salarios percibidos por los hogares más acomodados). Aunque estas conclusiones se mantienen cualitativamente para todos los países que componen nuestra muestra, nuestros análisis revelan diferencias significativas entre países, poniendo de relieve las distintas dinámicas del mercado laboral en los distintos países. En particular, los países en los que la tasa de desempleo y los salarios reales fluctuaron más durante el ciclo económico son aquellos para los que se estiman los mayores impactos (véase, por ejemplo, Irlanda, Luxemburgo, España y Portugal). Los aspectos relacionados con la flexibilidad del mercado laboral también parecen configurar la reacción de los salarios a la política monetaria anticíclica.

El tercer capítulo, titulado "*Effects of monetary policy shocks on income mobility in the euro area countries*", también se centra en los países que dieron origen a la UEM. Desde una perspectiva de movilidad relativa, esta investigación trata de desvelar en qué medida las movilidades ascendentes y descendentes de las distintas clases de renta a lo largo de la distribución se han visto afectadas por la política monetaria aplicada por el Banco Central Europeo. Utilizando los datos longitudinales proporcionados por las Encuesta Europea sobre la Renta y las Condiciones de Vida (EU-SILC), desarrollamos métricas de movilidad para cada clase de renta, midiendo los cambios al alza (movilidad ascendente) y a la baja (movilidad descendente) en la posición relativa de los individuos. La dimensión temporal recogida en el análisis incluye todos los datos disponibles en el momento de la elaboración de la investigación, es decir, las oleadas de 2005 a 2016 (incluidos los datos de 2004 a 2015).

La interacción y endogeneidad existentes entre las variables del modelo favorecen el uso de un sistema de ecuaciones simultáneas. Los resultados no comunicados pusieron de manifiesto que la aplicación de la metodología VAR conducía a estimaciones que no satisfacían la condición de estabilidad para distintas especificaciones del modelo. De hecho, según las distintas pruebas aplicadas al conjunto de datos de panel, las variables son procesos integrados de primer orden. Además, dado que la estructura subyacente no es la misma para cada una de las unidades (países) que componen la muestra, el modelo incluye efectos fijos

para tener en cuenta la heterogeneidad individual de cada país. Por lo tanto, los datos se analizan utilizando modelos de vector de corrección de errores (VEC), los cuales nos permiten estimar funciones de respuesta al impulso de política monetaria y examinar tanto la dirección como la magnitud del efecto de una perturbación, así como evaluar la persistencia de la perturbación en el tiempo. La observación de los indicadores de movilidad de los ingresos derivados de los datos EU-SILC muestra que las cifras de movilidad ascendente y descendente no son uniformes en todos los países que componen la muestra. La dispersión es mayor en el caso de las tasas de movilidad descendente, que en algunos países son 3,5 veces superiores a las de otros países en el mismo año. Las razones que explican estas disparidades incluyen las características estructurales e institucionales que prevalecen en cada país. Durante el periodo estudiado (2004-2015), los datos revelan una tendencia general descendente tanto en la movilidad ascendente como en la descendente en casi todos los países, lo que apunta hacia una creciente preservación del statu quo. Este parece ser el caso de todos los países, con la excepción de Portugal y Luxemburgo, que muestran una tendencia diferencial. En Portugal, tanto la movilidad ascendente como la descendente presentan un cambio estructural en torno a 2008-2009, cuando se estabilizaron en torno a niveles muy superiores a los existentes antes de la CFG. En el caso de Luxemburgo, ambas movilidades oscilaron más bien horizontalmente durante la mayor parte de los años, pero luego experimentaron un fuerte aumento interanual entre 2014 y 2015.

Considerando el conjunto de la población, se observa que una perturbación negativa (expansiva) de los tipos de interés reales a largo plazo parece fomentar la movilidad ascendente (porcentaje de la población que experimenta movimientos de dos o más deciles hacia arriba) y desincentivar la movilidad descendente (porcentaje de la población que experimenta movimientos de dos o más deciles hacia abajo). Los resultados específicos para cada una de las clases de renta muestran que el impacto de la política monetaria del BCE sobre la movilidad de la renta difiere entre las distintas clases. Para la parte inferior de la distribución de la renta, los resultados no son estadísticamente significativos, lo que sugiere que la política monetaria podría no haber tenido un impacto significativo en la movilidad ascendente de la clase baja. Esto podría sugerir que, ante la aplicación de una política monetaria expansiva, los beneficios obtenidos por los individuos ubicados en la parte inferior de la distribución de renta podrían únicamente haberles permitido preservar su posición relativa dentro de su propio decil, sin generar un ascenso en la escala de ingresos.

En cuanto a las clases medias, la política monetaria parece haber sido especialmente favorable, ya que la política expansiva parece haber impulsado la movilidad ascendente de estos hogares. Los resultados sugieren que una política monetaria expansiva puede impulsar la movilidad ascendente y obstaculizar la movilidad descendente de la clase media-baja, favoreciendo especialmente a este grupo de renta. Sin embargo, los resultados para la clase media-alta no parecen ser estadísticamente significativos. Para el caso de la clase alta, la relajación monetaria parece disminuir su movilidad descendente, lo cual resulta coherente con la literatura que sugiere que la política no convencional parece aumentar las rentas del capital de los ricos

Además de la política monetaria, los mercados financieros privados también desempeñan importantes funciones macroeconómicas que son cruciales para limitar las desaceleraciones y fomentar las recuperaciones. Más específicamente, los mercados de capital tienen la capacidad de actuar como un mecanismo de compartición de riesgos a nivel internacional, permitiendo que los países puedan hacer frente a shocks macroeconómicos domésticos gracias a la recepción de renta extranjera. Tal y como ocurrió durante la crisis financiera mundial y la crisis del COVID-19, la mayoría de las perturbaciones que afectan a los países de la zona euro implican consecuencias heterogéneas entre países, pues el impacto último depende también de factores internos tales como la importancia para la economía doméstica de los sectores más afectados. En este contexto, los flujos de renta desde las economías menos afectadas hacia aquellas que sufren un mayor impacto pueden ayudar a desligar parcialmente el ingreso de las fluctuaciones en la producción doméstica. En última instancia, este mecanismo de compartición de riesgos puede ayudar a contener la gravedad de las recesiones y sus efectos nocivos sobre el consumo en los países más afectados, limitando asimismo las implicaciones negativas para la desigualdad. El mecanismo de estabilización macroeconómica que los mercados de capital internacionales pueden suponer tiene especial relevancia en el caso de la Unión Monetaria Europea (UME) donde la política monetaria única no puede reaccionar ante impactos que únicamente afectan a un país en específico. Asimismo, la arquitectura institucional de la UME y, concretamente, la inexistencia de una política fiscal supranacional también refuerza el argumento a favor de mecanismos alternativos de estabilización macroeconómica. En esta dirección, el Informe de los Cinco Presidentes (Comisión Europea, 2015) menciona la necesidad de un mecanismo de compartición de

riesgos internacional intra-UME para complementar las herramientas nacionales a disposición de los países de la euro área para contrarrestar los impactos puramente domésticos.

La existencia de un mercado de capitales eficiente e integrado es un requisito indispensable para el funcionamiento de los mecanismos de compartición de riesgos privados. Las últimas tres décadas han vivido un aumento en la apertura de las cuentas de capitales en Europa, generada por un continuo decrecimiento en el número de restricciones que los países imponen sobre las transacciones financieras transfronterizas. Las políticas de liberalización de los movimientos internacionales de capital han ganado adeptos en una búsqueda del inversor extranjero mediante cambios normativos, tales como las nuevas políticas que aumentan las exenciones de los impuestos de sociedades y los impuestos relacionados con las importaciones (UNCTAD, 2021). En la zona del euro, desde la década de 1990, la globalización financiera y la creación de la UME han generado oportunidades de inversión transfronteriza, permitiendo a los inversores diversificar el riesgo de sus ingresos financieros entre un mayor número de países (Kalemlı-Ozcan et al., 2004; Kose et al., 2009; Balli et al., 2013). El Banco Central Europeo (2016, 2017) defiende que una mayor integración del mercado de capitales que consiga mejorar la diversificación es clave para potenciar los beneficios de la compartición de riesgos internacional y alcanzar una mayor estabilidad macroeconómica. Tras el establecimiento de la Unión Bancaria, la Comisión Europea está trabajando en medidas para fomentar la profundización de los mercados de capitales en Europa. Uno de los principales objetivos de la Unión Europea de Mercados de Capitales es aumentar la resiliencia de las economías a las perturbaciones locales mediante una mejora en la distribución internacional de los riesgos domésticos.

Por su parte, la segunda parte de esta tesis doctoral, que comprende los capítulos cuarto y quinto, se centra en el estudio de los mercados de capitales y sus efectos sobre la desigualdad de la renta. En primer lugar, se adopta una perspectiva macroeconómica y se evalúa hasta qué punto los flujos internacionales de capital han contribuido a proteger las economías domésticas de las fluctuaciones idiosincráticas en la renta nacional, ayudando así a los países más afectados a limitar los efectos negativos de las recesiones y, por consiguiente, el consecuente deterioro en la desigualdad de la renta. Asimismo, se examina el papel de la integración financiera de facto, esto es, el papel que juega el tamaño de las inversiones internacionales y su composición. La literatura revela que la medida en que los distintos hogares se benefician del apoyo macroeconómico que los flujos financieros pueden aportar varía según las clases de renta, y depende del contexto específico, así como de factores

socioeconómicos. A este respecto, en segundo lugar, nos centramos en el papel de la integración financiera de iure, esto es, la regulación financiera, y adoptamos una perspectiva microeconómica para analizar el efecto que las políticas de apertura de las cuentas de capitales podrían haber tenido sobre los distintos hogares pertenecientes a distintas clases de renta y, por tanto, sobre la distribución de la renta.

Más concretamente, a lo largo de los capítulos cuarto y quinto se abordan los siguientes objetivos específicos:

- En primer lugar, investigar la contribución de los mercados financieros internacionales y, más específicamente, de los mercados de capitales, a la compartición de riesgos en los países de la eurozona. Asimismo, se analiza la importancia de la integración financiera, así como el papel de la composición de las carteras de inversión internacional.
- En segundo lugar, analizar las potenciales implicaciones distributivas de la regulación de la cuenta de capitales en Europa. Se pone el foco en la relación existente entre la apertura de los flujos de inversión directa extranjera y la proporción de renta obtenida por las clases de renta, la cual parece estar determinada por el nivel educativo de los trabajadores pertenecientes a las distintas clases.

El cuarto capítulo, *“A deep dive into the capital channel of risk sharing in the euro area”*, se centra en una submuestra de países de la zona del euro y trata de analizar la distribución internacional del riesgo, así como su evolución reciente, para aportar evidencia sobre el papel desempeñado por los flujos de capital. Además, se desarrolla una extensión del modelo principal empleado en la literatura para abordar los patrones geográficos del canal de capital del reparto de riesgos, revelando disparidades entre las regiones del sur y del norte de la zona del euro. Por último, se aborda el impacto potencial de la composición de las posiciones de capital externo y se ofrecen perspectivas específicas para los distintos instrumentos financieros.

La investigación parte de la observación de que el choque COVID-19, y la crisis asociada, han reavivado el interés por la distribución internacional del riesgo, cuyo objetivo último es garantizar que los agentes estén asegurados contra el riesgo diversificable internacionalmente. En este sentido, la metodología desarrollada en la contribución seminal de Asdrubali et al. (1996) permite descomponer las variaciones (idiosincrásicas) específicas de

cada país en el crecimiento de la producción en diferentes elementos que permiten medir hasta qué punto la distribución internacional del riesgo se materializa a través de (1) la renta neta de los factores procedente del extranjero (es decir, el canal del capital), (2) las transferencias fiscales supranacionales y las remesas privadas (es decir, el canal de las transferencias internacionales), y (3) los préstamos y empréstitos (es decir, el canal del crédito). La investigación hace hincapié en el canal del capital y, para evaluar la importancia tanto de la integración del mercado de capitales como de la composición de las carteras exteriores, se basa en datos del Fondo Monetario Internacional (FMI). En concreto, se utilizan datos sobre tenencias de cartera transfronterizas de la Encuesta Coordinada sobre Inversión de Cartera (CPIS) y datos sobre posiciones de inversión transfronterizas de la Encuesta Coordinada sobre Inversión Directa (CDIS).

Para abordar la endogeneidad entre los distintos subcomponentes del crecimiento de la producción y tener en cuenta las complejas dependencias dinámicas entre ellos, nos basamos en un enfoque de múltiples ecuaciones. En concreto, todos los coeficientes se estiman conjuntamente en un marco vectorial autorregresivo (VAR). Así pues, se prefiere el VAR a los enfoques estáticos basados en regresiones aparentemente no relacionadas (SUR), también empleados en la literatura, que no tienen en cuenta la endogeneidad existente en los datos. Siguiendo la literatura empírica, para identificar una perturbación exógena al producto interior bruto (PIB), aprovechamos la recursividad natural a corto plazo de los datos de las cuentas nacionales (que implica, por ejemplo, que la renta neta presupone que la renta imponible se ha generado previamente). En este sentido, la perturbación se identifica mediante factorización triangular.

Los resultados sugieren que la contribución de los mercados de capitales internacionales a la distribución internacional del riesgo en la zona del euro sigue estando en gran medida desaprovechada, sobre todo en comparación con una unión monetaria establecida desde hace mucho tiempo como la de Estados Unidos (EE.UU.). A pesar de la mejora que siguió a la creación de la Unión Monetaria Europea, que creó oportunidades de inversión internacional y contribuyó a una mayor diversificación de la propiedad, los mercados de capitales sólo han permitido suavizar en torno al 5-10% de las fluctuaciones idiosincrásicas del PIB en las dos últimas décadas. Esto contrasta fuertemente con EE.UU., donde la contribución del canal de capital del reparto de riesgos ha sido entre tres y cinco veces mayor. Los resultados indican que el canal del crédito ha sido históricamente el mecanismo más importante para la distribución transfronteriza del riesgo en la zona del euro,

aunque se vio temporalmente afectado durante la crisis financiera mundial y la posterior crisis de la deuda soberana. Durante este período, las perspectivas crediticias de la mayoría de los países afectados se deterioraron y los mercados financieros se endurecieron. Esta reducción de los flujos financieros entre los países de la zona del euro perjudicó la distribución del riesgo a través del canal del crédito.

La distribución internacional del riesgo a través de los mercados de capitales difiere enormemente entre los países de la zona del euro y presenta similitudes regionales. En particular, la contribución del canal de capitales es significativamente menor en los países del sur (España, Grecia, Italia y Portugal) que en los del norte (Austria, Bélgica, Alemania, Finlandia, Francia y Países Bajos). El tamaño de las posiciones de capital extranjero (es decir, la integración financiera "de facto") ofrece una explicación parcial a esta conclusión. En particular, las carteras de los países del norte (en porcentaje del PIB) son aproximadamente el doble que las de los países del sur. La diferencia es similar en el caso de las inversiones directas. Los análisis realizados permiten identificar la contribución al reparto del riesgo de los flujos intrarregionales (es decir, los flujos netos de renta de los factores entre países pertenecientes a la misma región) y los flujos interregionales (es decir, los flujos netos de renta de los factores entre países pertenecientes a regiones diferentes). En los países del sur, la mejora de la distribución del riesgo a través de los canales de capital durante el período 2000-2012 se debió principalmente a los flujos interregionales. Sin embargo, desde la CFG, el canal de capital interregional ha disminuido notablemente, llegando incluso a ser negativo durante los últimos diez años, lo que indica que está ejerciendo un efecto procíclico (es decir, exacerbando en lugar de suavizando las fluctuaciones idiosincrásicas del PIB). Este colapso parece estar relacionado con la fuerte disminución de los pasivos transfronterizos interregionales sufrida por los países del Sur. En los últimos años, la contribución intrarregional ha seguido una tendencia al alza, pero sólo ha podido compensar parcialmente la contribución negativa de los flujos interregionales. Como resultado, se estima que el efecto total del canal de capital en la distribución del riesgo en los países del Sur es cercano a cero. Esto contrasta fuertemente con la situación de los países del norte, donde el colapso de la distribución interregional del riesgo durante la recesión fue menos pronunciado, y las mayores contribuciones de los flujos intrarregionales permitieron al canal de capital suavizar alrededor del 6% de las perturbaciones idiosincrásicas del PIB en los últimos años de nuestra muestra.

Atendiendo a la composición de las carteras transfronterizas (datos de la CPIS), la investigación concluye que las fluctuaciones de los pagos de intereses relacionados con los activos y pasivos de deuda de la cartera a largo plazo, así como los pagos de dividendos derivados de los pasivos de renta variable, parecen haber proporcionado un importante efecto de distribución del riesgo. Sin embargo, y en consonancia con el tamaño relativo de estas carteras, la contribución ha sido mucho mayor en el caso de los países del norte. Curiosamente, a pesar de que los pasivos de renta variable sólo representan una pequeña parte del total de pasivos transfronterizos para ambas regiones (9% y 17% para los países del sur y del norte, respectivamente), estos instrumentos están asociados a un efecto adicional similar de distribución del riesgo cuando se comparan con los pasivos de deuda a largo plazo (85% y 79%, respectivamente). En cuanto a las tenencias de inversiones extranjeras directas (datos de la CDIS), esta investigación pone de relieve que las entradas de capital derivadas de las posiciones de capital entrante desempeñaron un papel importante en la distribución del riesgo en los países del norte, mientras que el efecto parece ser insignificante en el sur. La explicación radica en la magnitud relativa de los flujos de IED. En particular, la inversión entrante hacia los países del norte (en % del PIB) fue más de seis veces superior a la recibida por los países del sur.

Esta investigación tiene importantes implicaciones para el debate político sobre la necesidad de unos mercados financieros mejor integrados en la zona del euro y el desarrollo de la Unión de Mercados de Capitales (UMC). Los resultados sugieren que la capacidad de distribución de riesgos del canal de capitales sigue estando muy explotada, lo que refuerza la búsqueda de una mayor integración financiera.

El quinto y último capítulo de esta tesis doctoral, "*Foreign direct investment openness and income classes in Europe around the Great Recession*", abarca el periodo comprendido entre 2007 y 2013 y examina las implicaciones distributivas de la regulación de la cuenta de capital. En particular, se centra en un área específica de la desregulación financiera: la liberalización de la cuenta de capital y, dentro de ella, la inversión extranjera directa (IED). Esta investigación evidencia una relación entre la apertura de los flujos de IED en 27 países europeos y la proporción de renta acumulada por las distintas clases de renta. El análisis también analiza hasta qué punto esta relación está determinada por el nivel educativo, que varía considerablemente entre las distintas clases de renta. La investigación comienza exponiendo la tendencia hacia la liberalización de la cuenta de capital que la mayoría de los países desarrollados han experimentado en las últimas tres décadas, y aporta una revisión de la

literatura centrada en los efectos potenciales para el crecimiento económico, la estabilidad financiera y, más concretamente, la desigualdad. Dado que esta investigación se centra en este último aspecto, el capítulo detalla el marco teórico que vincula la desigualdad de ingresos y la globalización financiera, en general, y la apertura a la IED, en particular.

Gran parte de esta literatura ha abordado la cuestión desde un enfoque puramente macroeconómico, ignorando así las características sociodemográficas de la población. Alternativamente, los enfoques a nivel microeconómico han analizado los mecanismos precisos de la renta individual, pero omitiendo información sobre las características del país. Con el fin de proporcionar tanto la composición sociodemográfica de la población como el contexto específico del país, modelizamos la estructura jerárquica de nuestros datos utilizando un enfoque multinivel, también conocido como modelos jerárquicos. En este sentido, los individuos (nivel 1) se agrupan en países (nivel 2), lo que nos permite medir las variaciones a nivel de país (diferencias entre grupos) en relación con las variaciones a nivel individual (diferencias dentro de los grupos). Este enfoque multinivel garantiza una mayor precisión en comparación con los modelos que emplean datos agregados a nivel de país. Mediante este enfoque, se evalúa el papel desempeñado por la liberalización de la IED en las cuotas de renta y el efecto diferencial en función de la clase de renta y el grado de cualificación (aproximado por el nivel educativo) de los individuos. Este análisis de la relación entre la liberalización de la cuenta de capital y la distribución de la renta pone de relieve que la apertura de la IED parece haber beneficiado a todas las clases de renta. Sin embargo, a pesar de que el efecto es positivo para toda la población, la magnitud difiere, lo que sugiere que los efectos de la apertura de la IED sobre la participación en la renta son heterogéneos a lo largo de la distribución de la renta y parecen haber beneficiado sobre todo a la clase alta. A continuación, la magnitud se reduce progresivamente a medida que nos desplazamos hacia el extremo izquierdo de la distribución de la renta, lo que conduce a un impacto global de aumento de la desigualdad.

La hipótesis de complementariedad capital-cualificación en la que se centra la investigación sugiere que la liberalización de los flujos de IED en las economías avanzadas beneficia especialmente a los trabajadores nacionales altamente cualificados, ya que tienden a ser más complementarios respecto a las entradas de capital y menos sensibles a las salidas de IED que buscan externalizar procesos intensivos en mano de obra a países emergentes con salarios más bajos. Los resultados validan esta hipótesis, ya que ponen de manifiesto el papel clave que desempeña el nivel educativo en la configuración de la relación entre la apertura de

la IED y la participación de los individuos en la renta nacional. En particular, los hogares que cuentan con un mayor porcentaje de individuos con un alto nivel educativo se benefician más que los hogares con un bajo nivel educativo de dicha apertura. Esto implica un aumento desproporcionadamente mayor de la participación en la renta de la clase alta, ya que los individuos con un alto nivel educativo no se distribuyen aleatoriamente entre la población, sino que tienden a estar sobrerrepresentados en la parte alta de la distribución.

Los resultados sugieren que la liberalización de la cuenta de capital que afecta a las políticas de IED tiende a aumentar la desigualdad de ingresos a través de la hipótesis de complementariedad capital-cualificación, siendo este efecto muy persistente para todos los años de nuestra muestra, es decir, entre 2007 y 2013. El hecho de que este efecto distributivo persista a lo largo de los años examinados, independientemente del entorno económico (situaciones anteriores, agudas y posteriores a la crisis) podría deberse, en parte, a que la distribución de las personas con un alto nivel educativo no es sensible al ciclo económico. Este estudio tiene importantes implicaciones desde el punto de vista político pues sugiere que la distribución de la educación, como fuente significativa de desigualdad de oportunidades, constituye un elemento central en el vínculo entre la liberalización financiera de los flujos de IED y la desigualdad de ingresos. Por lo tanto, más allá de las decisiones políticas sobre el grado de liberalización de la cuenta de capital, una inversión mayor y más equitativa en educación que contribuya a crear un terreno de juego más justo para todos los miembros de la sociedad podría considerarse una intervención pública clave que puede configurar la relación entre la apertura de la IED y la desigualdad de ingresos entre las clases de renta.

Mención internacional

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Publicaciones derivadas de la tesis doctoral

1. Pérez-Moreno, S., Martín Fuentes, N., & Juan-Francisco Albert (2021). Rethinking Monetary Policy in the Framework of Inclusive and Sustainable Growth. *Economic Policies for Sustainability and Resilience* (Editorial Palgrave Macmillan), 319-364. DOI: https://doi.org/10.1007/978-3-030-84288-8_8
2. Bárcena-Martín, E., Martín-Fuentes, N., & Pérez-Moreno, S (2023). Who Takes the Cake? The Heterogeneous Effect of ECB Accommodative Monetary Policy across Income Classes. *ECINEQ, Working Papers Series 657*, Society for the Study of Economic Inequality.
3. Bárcena-Martín, E., Martín-Fuentes, N., & Pérez-Moreno, S (2019). Effects of Monetary Policy Shocks on Income Mobility in the Euro Area Countries. *Panoeconomicus*, 66(3), 307-324. DOI: <https://doi.org/10.2298/PAN1903307B>
4. Martín-Fuentes, N., Born, A., Bremus, F., Kastelein, W., & Lambert, C. (2023). A Deep Dive into the Capital Channel of Risk Sharing in the Euro Area", ECB Working Paper, 2864, November 2023.
5. Arestis, P., Bárcena-Martín, E., Martín-Fuentes, N., & Pérez-Moreno, S. (2023). Foreign Direct Investment Openness and Income Classes in Europe around the Great Recession. *Economic Research-Ekonomska Istraživanja*, 36(3). DOI: <https://doi.org/10.1080/1331677X.2022.2163270>

Introduction

I. Background and context

In recent years, there is an overall concern about the situation of the middle class and its future prospects in economically advanced countries, which stems from the observation that income inequality has been gradually increasing since mid-1980s and the middle class has considerably lost ground (see, e.g., Cowen, 2013; Vaughan-Whitehead, 2016; Pew Research Center, 2017). This has located the questions of income distribution, inclusive growth and the distributive implications of macroeconomic policies at the forefront of the economic analysis (see Stiglitz, 2012; Deaton, 2013; Piketty, 2014; Atkinson, 2015; Galbraith, 2016; etc.). Moreover, the arising of theories supporting the idea that advanced economies do not inevitable evolve toward more egalitarian societies, such as Piketty (2014), which opposes to the widely refuted traditional view based on Kuznets (1955), has further sparked this debate. In this regard, promoting sustained, inclusive and sustainable growth, full and productive employment, and decent work for all constitutes a principal element of the 2030 Agenda (see United Nations, 2015). This goal results from the increasing awareness of the need for practical tools to deliver a more socially inclusive and environmentally sustainable economic growth, both of which could be understood as different dimensions of equity, namely intra-generational and inter-regional equity.

For the case of Europe, various institutions have evidenced a steady increase in income concentration, which holds true for various definitions of income (including gross and net income) and for different data sources (see e.g. World Inequality Lab, 2019, 2020, and the Bank of International Settlement, 2022). The World Inequality Database (WID) documents that between 1980 and 2000, the average annual income accrued by the top 10% grew at 2%, more than four times faster than that of the bottom 50%, for which the annual growth rate stood at around 0.3-0.5%. This steady decline in the relative position of the lower and middle-income classes further accelerated during the recession period and overall, over the past four decades, the income growth captured by the bottom 50% has been slightly below that accrued to the top 1% (see e.g. World Inequality Lab, 2019 and 2020). The academic literature has identified the key secular trends that largely explain the structural increase in income inequality. Most notably, the deepening of globalisation, skill-biased technological change, demographic trends, changes in labour market institutions, and the decline in the progressivity of the tax systems are some of the major structural drivers studied in the literature (see e.g. Atkinson, 2015; Milanovic, 2016; Chancel, 2019 and Blanchard and Rodrik, 2021).

The Global Financial Crisis (GFC) gave yet another push to the pre-existing inequality-increasing trend, further exacerbating it. The impact of the economic crisis was particularly severe and long-lasting. According to Eurostat, the euro area unemployment rate rose from a pre-crisis low of 7.3% in March 2008 to a peak of 12.2% in April 2013, during the sovereign debt crisis, with around 5.5 million people having lost their job. The burden of the recession was unevenly distributed across income classes and the greatest impact rested over the shoulders of low and middle-income households thereby aggravating income inequality. The European Central Bank (2014) highlights employment losses in the euro area were strongly concentrated among young and low-skilled workers, which tend to be located in the leftmost side of the income distribution. The pro-cyclical behaviour of income inequality is a phenomenon common to most, if not all, recessions and largely relates to labour market dynamics. During economic downturns, low-income workers are more likely to be laid off, while the employment status of the richer tends to be more resilient to macroeconomic shocks. Better off households are not only less likely to lose their jobs but also tend to own a more diversified income mix, where capital income plays a larger role and thus partially compensate the temporary decline in labour income. Moreover, the macroeconomic importance of labour income inequality is greater than that of capital income: The World Bank (2018) reveals that the contribution of labour income to total income inequality exceeds 70% in most European countries and helps explain the bulk of the movements in within-country inequality in the recent past.

After the recession years, unemployment remained well above pre-GFC levels for more than a decade, and it was not until the end of 2019 when the unemployment rate in the euro area declined to 7.5%, only 0.2 percentage points above the previous minimum. The employment recovery was distributed heterogeneously across income classes, with poorer households lagging behind the rest of the income classes and largely suffering from an incomplete recovery. In fact, the labour earnings of low-skill workers and the new entrants still remained at lower levels more than a decade after the downturn (see BIS, 2022) and the recovery was unfortunately unable to bring income inequality fully back to its previous level. This episode evidence that protracted periods of unemployment do not only generate cyclical fluctuations in income inequality but might also damage workers' future employment prospects and leave long-lasting scars also referred to as hysteresis effect. The existence of inequality hysteresis implies macroeconomic stabilisation policies are not only justified by the cyclical component in output and unemployment, but also inequality. Instead, by helping to

counter severe and lengthy recessions, demand side policies could also insure against the risk that cyclical inequality becomes structural.

Monetary policy can play a central role in stabilising cyclical fluctuations and containing unwelcomed increases in unemployment. By delivering on its mandated objective on medium-term price stability, monetary policy helps support economic activity during recessions thereby improving welfare specially for the more disadvantaged, as these are more likely to suffer from employment deterioration and high inflation. Prior to the GFC, consensus shared by academics and central bankers suggested that monetary policy is not a key driver of the increase in inequality, as “monetary policy is neutral or nearly so in the longer term, meaning that it has limited long term effects on real outcomes like the distribution of income and wealth” (see Bernanke, 2015). More recently, this traditional view proposing the neutrality of monetary policy over the business cycle is losing ground against the notion that cyclical and trend changes are hardly ever independent. Inequality hysteresis requires successful monetary policy able to reduce the depth and the duration of downturns could reduce workers’ movements towards unemployment, thereby supporting growth and equity also in the longer-term.

During the GFC, the severity of the recession in the euro area led the European Central Bank (ECB) to deploy the full range of tools at its disposal, introducing major innovations in terms of operational and communication framework. Usual measures consisting in adjusting the key interest rates to steer short-term money markets were unable to fight against the severe downturn as policy rates fell below zero. Therefore, in order to foster the transmission of monetary policy towards the long-term rates that govern economy’s financing conditions, the ECB expanded its toolkit by including unconventional instruments, namely (i) negative policy rates, (ii) asset purchase programmes (APPs), and (iii) forward guidance. Once the policy rate reached the zero lower bound, the ECB implemented (ii) and (iii) so as to restore the functioning of financial markets and provide further monetary policy accommodation. Via the large-scale purchase of good quality securities, asset purchase programmes (also known as quantitative easing) sought to exert a more direct influence over long-term interest rates. In a similar vein, forward guidance entailed giving indications on the future course of monetary policy to influence expectations on future short-term interest rates and thus affect longer-term rates. The implementation of these unconventional monetary measures entailed deeper macroeconomic effects when compared to conventional tools, which further sparked the debate about the potential distributive effects of monetary policy among academics and

policymakers (e.g. Bernanke, 2013, 2015; Yellen, 2014; Draghi, 2016; Constâncio, 2017). Looking at advanced economies, the Bank of International Settlements (2022) observes an exponential increase in the share of central bank speeches mentioning inequality since 2014.

In this context, the first part of this dissertation focuses on the potential distributive implications of past ECB's conventional and unconventional monetary policy tools implemented after the onset of the crisis in 2007-08 and until the outbreak of the COVID-19 pandemic. This study examines the various theoretical channels through which monetary policy can affect equity and then deep-dives empirically into the potential consequences for the distribution of income. The focus is on the labour market, as it is the strongest mechanism through which monetary policy affects income inequality. Notwithstanding reducing inequality is inevitably a second-order issue for monetary policy in the face of the price stability mandate, this investigation intends to help rethinking monetary policy in the light of the challenges of our times.

Besides public support measures via monetary policy, private financial markets also perform important macroeconomic functions that are crucial to limit downturns and foster the recoveries. More specifically, capital markets could provide an important international risk sharing effect by allowing countries to insure themselves against purely domestic shocks. As was the case during the GFC and the COVID-19 crisis, most shocks affecting euro area countries entail highly asymmetric consequences across countries, as the ultimate impact on countries' output depend on domestic factors such as the importance of the economic sectors hit more severely. In this context, capital flows from less affected towards more affected economies could help decouple domestic income from fluctuations in domestic output, which could ultimately help contain the severity of recessions in highly impacted countries thus limiting the ultimate negative implications for inequality. The macroeconomic stabilisation effect provided by international capital markets is of particular importance in the European Monetary Union (EMU) where the single monetary policy is unable to react to country-specific shocks. Likewise, the institutional architecture of the EMU and, more specifically, the lack of central supra-national fiscal power, also reinforces the argument for alternative stabilisation mechanisms. In this vein, as highlighted in the Five Presidents' Report (European Commission, 2015), international risk sharing within the EMU is needed to complement national tools employed by euro area countries to counter the impact of domestic shocks.

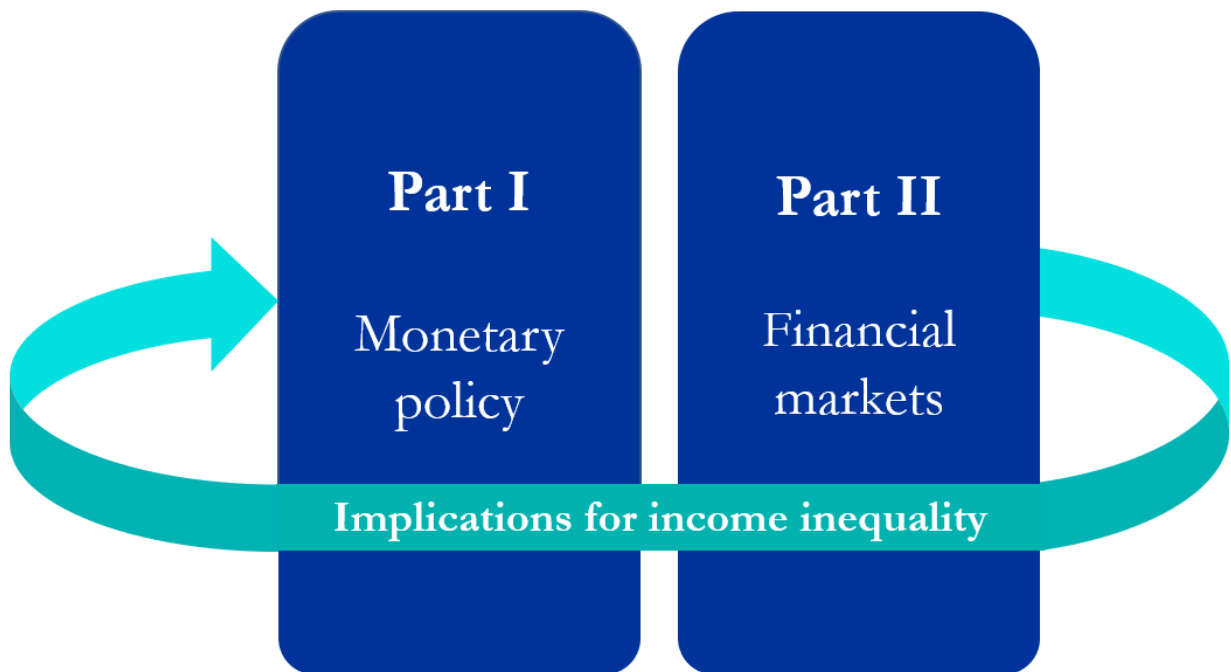
Efficient and integrated capital markets are a prerequisite for private risk sharing. The past three decades have been associated with greater openness of capital accounts, especially

in developed countries, driven by a steady decline in the number of restrictions that countries impose on cross-border financial transactions. Policies freeing international capital movements have acquired a friendly tone and have sought to attract foreign investment, lowering entry barriers via regulatory changes, such as new policies enhancing exemptions of corporate taxes and import duties (UNCTAD, 2021). In the euro area, since the 1990s, financial globalization and the creation of the European Monetary Union (EMU) have created cross-border investment opportunities and contributed to greater ownership diversification, allowing investors to spread their income risk across a larger number of countries (Kalemli-Ozcan et al., 2004; Kose et al., 2009; Balli et al., 2013). The European Central Bank (2016, 2017) remains convinced that further capital market integration that improves portfolio diversification are key to boost the potential welfare benefits of cross-country risk sharing and to achieve greater macroeconomic stability. After the establishment of the Banking Union, the European Commission is working on measures to foster capital market deepening in Europe. To make economies more resilient to local shocks through better international risk sharing is one of the key goals for a European Capital Markets Union (CMU).

In this context, the second part of the dissertation focuses on the potential stabilizing effect of capital markets and their impact on income inequality. First, we adopt a macroeconomic perspective and assess the extent to which capital flows have contributed to shield domestic income from idiosyncratic fluctuations in domestic output, thereby helping worse off countries to limit the potential negative implications of downturns and the subsequent deterioration of income inequality. The role of *de facto* financial integration (i.e. size of cross-border portfolios and their composition) is also examined. The literature reveals the extent to which different households participate from the macroeconomic support provided by capital markets might vary across income classes as it is eminently context-specific and strongly depends on socioeconomic factors. In this regard, secondly, we focus on the role of *de iure* financial integration and adopt a microeconomic perspective to analyse the extent to which capital account openness might have had distinct effects across households and the ultimate impact on the distribution of income.

Overall, this investigation focuses on topics related to monetary policy and financial markets and analyses their implications for income inequality (see Figure 1).

Figure 1. Research areas



II. Objectives

This dissertation aims to explore monetary policy and financial markets and their potential implications for income inequality. According to the five chapters that compose this doctoral thesis, the objectives are the following:

1. To address the distributional and environmental issues in the current contextual setting of monetary policy. The book chapter provides a revision of the theoretical and conceptual frameworks that link together monetary policy and the paradigm of inclusive and sustainable growth.
2. To study the heterogeneous effects of the ECB's monetary policy across income classes in the euro area via supporting macroeconomic activity. In particular, this research tackles how expansionary monetary policy stimulates economic activity and boosts the labour market which ultimately affects income classes differently. Among the different transmission mechanisms of monetary policy, this investigation focuses on the earnings heterogeneity and income composition channels.
3. To empirically address the extent to which ECB's monetary policy exerts a distinctive impact on the relative position of the different classes in the income distribution. For this purpose, we measure the implications of monetary policy for both upward and downward mobility across income classes in the euro area.

4. To investigate the contribution of international financial markets, in general, and capital markets, in particular, to risk sharing across euro area countries. The importance of financial integration and the role played by the composition of external capital positions are also addressed.
5. To analyse the potential distributional implications of capital account regulation in Europe. The focus is on the link between the openness of foreign direct investment flows and the income share of the different income classes, which seems to be largely shaped by the educational level.

In this regard, the ultimate aim is to reflect upon how the recent evolution of income inequality in the euro area might have been affected by the transmission mechanisms of monetary policy as well as by international financial markets.

III. Thesis outline

The title of the first chapter of the thesis is “Rethinking monetary policy in the framework of inclusive and sustainable growth”. This book chapter builds on the fact that socially inclusive and environmentally sustainable economic growth is a central priority of public policy for most governments worldwide. In this context, monetary policy is a powerful macroeconomic policy tool connected with both distributional and environmental issues, with many transmission mechanisms that shape a bi-directional link between them. Following the introduction, this study elaborates on the theoretical and conceptual frameworks of inclusive and sustainable growth, highlighting the different paradigms that have succeeded one another over the last decades. Then, it deep dives on the two central elements of inclusive and sustainable growth, namely distributional and environmental concerns, and elaborates on how they have recently jumped to the forefront of the political and societal debate. The fourth section analyses the linkages between monetary policy and economic inequality. On the one hand, it provides a systematic revision of the different transmission channels through which monetary policy decisions might affect both income and wealth inequality and presents the main findings and the challenges that the literature is facing to empirically address these linkages. On the other hand, it examines the opposite causal link, that is, whether rising inequalities might entail consequences for the performance of monetary policy and its ultimate effectiveness. The fifth section tackles the topic of environmental sustainability, elaborating on (i) how the associated concerns could be seen through the lens of monetary policy, (ii) what are the implications of climate-related transition and physical risks for

monetary policymakers, and (iii) what could be the role of monetary policy in the fight against climate change. The chapter closes by providing some policy proposals for conducting monetary policy in the face of distributional and environmental challenges.

The second chapter is titled “Who takes the cake? The heterogeneous effect of ECB accommodative monetary policy across income classes”. This work focuses on the set of countries that originated the Economic and Monetary Union (EMU-11) and provides evidence on the how monetary policy affects the different income classes via the labour market over the period 2006-2019. More specifically, this analysis makes use of micro level data from the European Statistics on Income and Living Conditions (EU-SILC) to estimate the unequal incidence of monetary policy on the employment status (i.e. extensive margin) and wages (i.e. intensive margin) across income classes. Furthermore, it sheds light on the implications via the extensive margin by disentangling the impact on the job loss risk (i.e. job separation rate) and on the probability of finding a job (i.e. job finding rate). Among the different transmission mechanisms of monetary policy, the theoretical framework in the investigation focuses on the two of main channels that operate via the labour market and affect income inequality: the income composition channel and the earnings heterogeneity channel. The literature review highlights previous analyses have shown sometimes-divergent results thus revealing that the impact of monetary policy on income inequality needs to be empirically addressed in each case. Then, the paper presents the micro- and macro-level data used in the analyses. The computation of class-specific metrics enabled by the micro data allows us to uncover certain stylised facts about how the labour market has evolved for the different income classes in the period under review. The empirical approach followed for the main analysis is the country-specific vector autoregressive (VAR) models and then, a series of robustness checks are produced using a set of panel local projection (LP) models. The investigation closes with the presentation of the conclusions reached.

The third chapter, titled “Effects of monetary policy shocks on income mobility in the euro area countries” also focuses on the countries that originated the EMU. From a relative mobility perspective, this investigation seeks to uncover the extent to which the upward and downward mobilities of the different income classes have been affected by the monetary policy implemented by the European Central Bank over the period 2004-2014. Using the longitudinal data provided by the European Statistics on Income and Living Conditions (EU-SILC), we develop mobility metrics by measuring upward (downward) changes in individuals’ relative position whenever they ascend (descend) towards two or more deciles

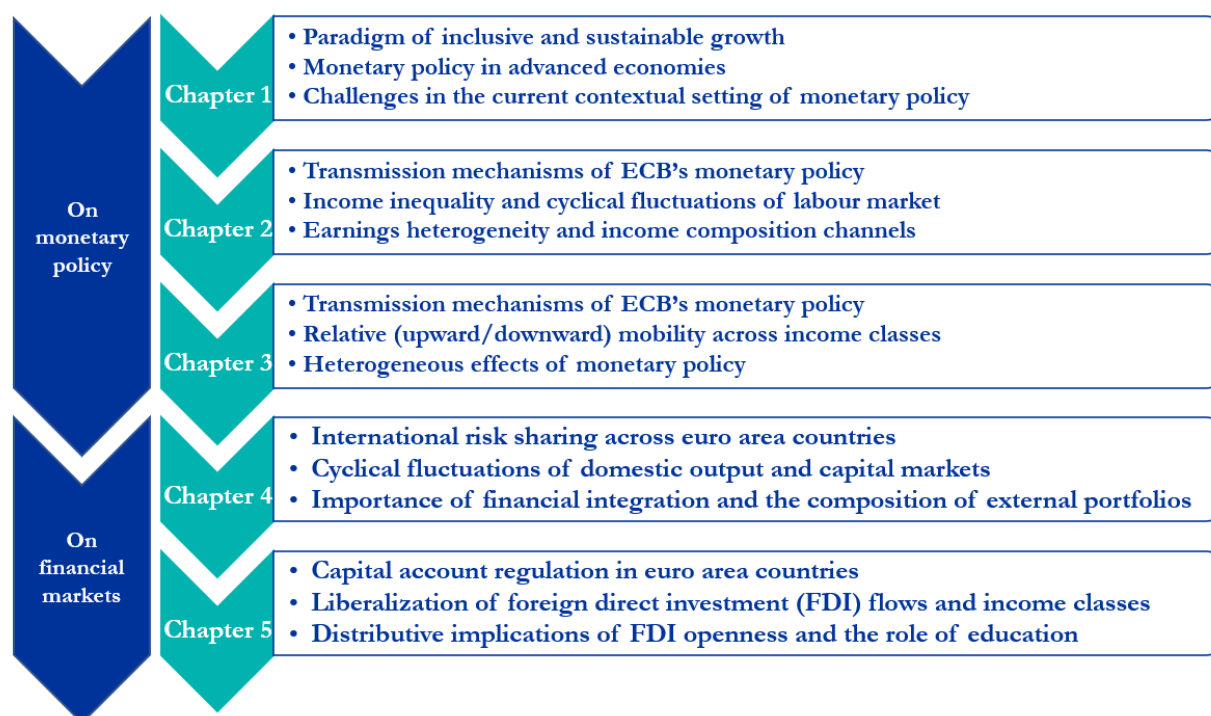
upward (downward). The statistical properties of the data favour the application of a simultaneous equation system, and the analysis is based on the estimate of a Vector Error Correction (VEC) model. The key results shown in this paper display how the upward and downward mobilities of the various income classes are affected by an expansionary shock to long-term real interest rates. Some concluding remarks are offered at the end of the paper.

The fourth chapter is titled “A deep dive into the capital channel of risk sharing in the euro area”. This research focuses on a sub-sample of euro area countries and seeks to analyse international risk sharing and its recent evolution to provide evidence on the role played by capital flows. Furthermore, the state-of-the-art model employed in the relevant literature is extended so as to address the geographical patterns of the capital channel of risk sharing, revealing disparities across the southern and northern euro area regions. Lastly, it goes beyond the *de facto* financial integration and touches upon the potential impact of the composition of the external capital positions and provides specific insights for the different financial instruments. The investigation starts from the observation that the COVID-19 shock, and the associated crisis have renewed the interest for international risk sharing, whose ultimate aim is to ensure that agents are insured against internationally diversifiable risk. In this regard, the paper states that well-functioning capital markets can help decouple domestic welfare from fluctuations in domestic output, thereby exerting a counter-cyclical effect on consumption. After detailing the theoretical and empirical backgrounds, the document presents the macroeconomic and financial data as well as the economic model to be applied. Econometrically, the use of Vector Autoregression Models (VAR) allows to generate the results, which are then followed by a section on the associated conclusions and policy implications.

The fifth and last chapter of the thesis, “Foreign direct investment openness and income classes in Europe around the Great Recession”, covers the period 2007-2013 and examines the distributional implications of capital account regulation. In particular, it focuses on a specific area of financial deregulation: capital account liberalisation and, within it, foreign direct investment (FDI). This research evidence a relationship between the openness of FDI flows across 27 European countries and the income share accrued by the different income classes. The analysis also considers the extent to which this relationship is shaped by the educational level, which varies considerably across income classes. The chapters starts acknowledging the capital account liberalisation most developed countries have undergone over the last three decades, and then reviews the literature focused on the potential effects for

economic growth, financial stability and, more concretely, inequality. As this research focuses on the latter, the chapter details the theoretical framework that links together income inequality and financial globalisation, in general, and FDI openness, in particular. Given that the distributive impact of financial policy depends strongly on the socioeconomic environment, and the regulatory and policy framework and is thus largely state-contingent, this research provides an empirical analysis. The second half of the paper provides details on the micro level and macro level data employed to estimate multilevel models, which is our preferred approach for handling hierarchical data. Lastly, the chapter provides the results, including a robustness check, and closes with the main conclusions of the investigation.

Figure 2. Main topics addressed in the chapters



IV. Data and methodology

The first chapter provides an ample literature review so as to examine and summarize the main ongoing debates about the linkages between monetary policy and the challenges associated with inequality and climate change. The research up to date points towards the existence of bi-directional causality links. Monetary policy seems to exert certain influence on income and wealth inequality and environmental sustainability. Likewise, the application of monetary policy might be affected by distributive and environmental aspects. The nature of this paper is purely qualitative.

The second chapter analyses the heterogeneous impact of ECB monetary policy across income classes in the euro area via the labour market. The class-specific labour market metrics are computed using household survey data from the European Statistics on Income and Living Conditions (EU-SILC), which is the reference source for comparative statistics on the distribution of income in Europe. The definition of the income classes is done via thresholds established in relation to percentages of the median income of the distribution, while the concept of income used to compute the limit is “disposable household income” as usual in the literature. We make use of both types of data provided by EU-SILC (cross-sectional and longitudinal data) and, for each of the four income classes included in the analysis (lower, lower-middle, upper-middle, and upper class), we estimate class-specific unemployment rate, job separation rate, job finding rate and labour income. We combine micro-level data from EU-SILC with a series of macroeconomic indicators which act as control variables in our various models. These are (1) real gross domestic product, (2) GDP deflator, (3) stock prices, (4) the term spread between the euro area 10-year Government bond yield and its 2-year counterpart. In order to proxy for the impact of monetary policy, while accounting for both conventional and unconventional measures implemented over the analysed period, we also include the (5) shadow rate from Wu and Xia (2020). For the local projections models estimated as robustness checks, we also make use of (6) the euro area monetary policy shocks estimated by Jarociński and Karadi (2020).

Macroeconomic analyses and policy evaluations require considering the interdependencies among the different economic variables, with the purpose of assessing the impacts from a global perspective and uncovering causal relationships. The existence of interactions between the analysed variables constitutes the main reason why a simultaneous equation system appears to be an accurate way to approach our analysis. Therefore, the main empirical approach used in this investigation is the estimate of vector autoregression (VAR) models. In order to identify an exogenous monetary policy shock, we follow two different identification strategies, namely triangular factorization and sign restrictions. This allows us to extract from the model an orthogonal deviation to the shadow rate which acts as a proxy for monetary policy. The robustness check is done by estimating a series of local projections (LP) models, where the monetary policy shock is not estimated in the model but instead is an exogenous variable included directly in the regression. When compared to the VAR approach, the local projections methodology computes the responses at each horizon, which makes

potential misspecification errors not to be compounded over time and becomes a natural methodology to cross-check the results emanating from the VAR models.

The third chapter examines the impacts of ECB monetary policy shocks on income mobility across income classes in the euro area. The class-specific metrics on income mobility are computed using the longitudinal file of the household survey data provided by EU-SILC. The time dimension captured in the analysis includes all the data available at the time of the elaboration of the investigation, i.e. waves from 2005 to 2016 (incl. data from 2004 to 2015). The EU-SILC has the advantage of collecting detailed information on individual and household income, and data is comparable across the participating European countries. The longitudinal component follows individuals for four consecutive waves, which allows us to derive mobility measures based on household market income changes over two consecutive years of data. Market income includes all income from work (salaries of employees and income of self-employed workers), income from capital and property, private transfers between households as well as income from private pension plans. This definition includes income before transfers in order to exclude, as much as possible, the importance of the automatic stabilisation effects of the transfer system. Individuals are assigned their household equivalent income (following the modified OECD equivalence scale) and split into deciles. Mobility is defined in relative terms and an upward (downward) movement across deciles is registered whenever an individual ascends (descends) two or more deciles. The different analyses are developed both for the population as a whole and also specifically by income class. For the latter, we split the population into four groups, namely lower class (first two deciles of the income distribution), lower-middle class (deciles three to five, both inclusive), upper-middle class (deciles six to eight, both inclusive) and upper class (population in the ninth and tenth deciles). Besides the mobility metrics, four macroeconomic variables are included as controls in the models, namely (i) long-term real interest rates (AMECO), (ii) private credit (World Bank), (iii) gross domestic product per capita (Eurostat), and (iv) unemployment rate (Eurostat).

The existing interaction and endogeneity among the variables in the model favour the use of a simultaneous equation system. Unreported results highlighted the application of the VAR methodology led to estimates that did not satisfy the stability condition for different model specifications. In fact, according to the different tests applied to the panel dataset, variables first order integrated processes. Furthermore, given that the underlying structure is not the same for each of the units (countries) composing the sample, the model includes fixed

effects so as to allow for the individual heterogeneity of each country. Therefore, the data is analysed by using the Vector Error Correction (VEC) methodology, which allows us to recover impulse response functions and examine both the direction and magnitude of a shock's effect and assess the persistence of the shock over time.

The fourth chapter, which studies the evolution of international risk sharing in the euro area with a focus on the capital channel, relies on national accounts data from Eurostat so as to follow the framework developed in the seminal contribution by Asdrubali et al. (1996). In this vein, the country-specific (idiosyncratic) variations in output growth are decomposed into different items which allow to measure the extent to which international risk sharing is materialising via (1) net factor income from abroad (i.e. the capital channel), (2) supra-national fiscal transfers and private remittances (i.e. international transfers channel), and (3) lending and borrowing (i.e. credit channel). The investigation puts the emphasis on the capital channel and, in order to assess the importance of both capital market integration and the composition of the external portfolios, it relies on data from the International Monetary Fund (IMF). In particular, we retrieve both data on cross-border portfolio holdings from the Coordinated Portfolio Investment Survey (CPIS) and data on cross-border investment positions from the Coordinated Direct Investment Survey (CDIS). In line with Balli et al. (2013), the data is retrieved and analysed separately for the different financial instruments (equity, short-term debt, and long-term debt) and for assets and liabilities. Throughout CPIS and CDIS, the IMF offers the most comprehensive collection of comparable data on cross-border capital positions for the countries in our sample. The use of this data for the purpose of analysing risk sharing has been previously used by key contributions in the literature such as Fratzscher and Imbs (2009), Pericoli et al. (2015) and Cimadomo et al. (2020).

To address endogeneity between the different sub-components of output growth and to account for the complex dynamic dependencies between them, we rely on a multi-equation approach. All the coefficients are estimated jointly in a vector autoregressive (VAR) framework. VAR is thus preferred over static approaches based on seemingly unrelated regressions (SUR), also employed in the literature, which fail to account for the existing endogeneity in the data. Following the empirical literature, in order to identify an exogenous shock to gross domestic product (GDP), we leverage the natural short run recursiveness of the national accounts data (which implies e.g. that net income presupposes taxable income has been previously generated). In this regard, the shock is identified via triangular factorisation.

The fifth chapter examines the extent to which the liberalisation of FDI flows alters the relative position of the income classes for a set of 27 advanced European economies in different economic environments around the GFC (2007-2013). For this purpose, we collect micro-level data on income distribution and individual sociodemographic characteristics from EU-SILC. For each individual, we compute as our dependent variable the income share of the individual (i.e. the proportion of total disposable income of a country), using as definition of disposable income the gross household income minus regular taxes on wealth and income, social insurance contributions and regular inter-household transfers paid. Furthermore, we collect a set of control variables related to demographic, labour and educational characteristics, which are key determinants of household income. In particular, we control by means of demographic characteristics of the household head, including (1) reported gender, (2) age, (3) whether she/he has a managerial position, and of the households, such as (4) the proportion of children, (5) the proportion of individuals older than 65, and (6) the proportion of individuals with chronic illness. We also include information on (7) whether there is lone parenthood in the household, (8) the proportion of individuals with tertiary education, and (9) the proportion of individuals working (either full or part-time). In addition, we control for the income class to which the individual belongs by adopting a relative definition of the income classes, where the thresholds are established in relation to the percentages of the country's median income. The aforementioned micro level data is complemented with macroeconomic data on real GDP per capita, collected from Eurostat. As key country-level explanatory variable, the models include an index measuring de jure FDI capital account liberalisation published by IMF Exchange Arrangements and Exchange Restrictions (AREAER). This index is widely employed in the literature and is developed by the IMF based on the regulations that countries apply.

A large part of this literature has addressed the issue from a purely macroeconomic approach, thereby ignoring the sociodemographic characteristics of the population. Alternatively, micro-level approaches have analysed the precise mechanisms of individual income but omitted information on country characteristics. To provide both the socio-demographic composition of the population and the country-specific context we model the hierarchical structure of our data using a multilevel approach, also known as hierarchical models. In this regard, individuals (level 1) are clustered into countries (level 2), which allows us to measure country-level variations (differences between groups) in relation to individual-level variations (within-group differences). This multilevel approach ensures a greater

precision in comparison to models employing aggregate country-level data. In accordance with the literature, we estimate the variance partition coefficient, which evaluates the proportion of the variance in income shares that can be attributed to differences between countries. Via this approach, we estimate different models and assess the role played by FDI liberalisation on income shares and the differential effect depending on the income class and the degree of skills (proxied by the education level) of the individuals.

Part I.

On monetary policy

Chapter 1

Rethinking monetary policy in the framework
of inclusive and sustainable growth

Reference: Pérez-Moreno, S., Martín-Fuentes, N., Albert, JF. (2022). Rethinking Monetary Policy in the Framework of Inclusive and Sustainable Growth. In: Arestis, P., Sawyer, M. (eds) *Economic Policies for Sustainability and Resilience*. International Papers in Political Economy. Palgrave Macmillan, Cham.

Summary: Promoting inclusive and sustainable growth clearly constitutes an important and principal element of the 2030 Agenda and its 17 Sustainable Development Goals (SDGs) (United Nations, 2015). Goal 8 seeks to promote sustained, inclusive and sustainable growth, full and productive employment, and decent work for all. Moreover, this Goal is closely interconnected with other SDGs such as Goal 10, which aims to reduce inequalities both within and between countries, and with Goals 13–15, focused on climate change and environmental degradation.

Most governments at all levels are concerned with promoting inclusive and sustainable economic growth as a way to integrate economic, social and environmental dimensions of sustainable development and contribute to achieving the SDGs in a context characterized by two major economic crises: the Great Financial Crisis (GFC) and the crisis resulting from the Covid-19 pandemic. In this line, over the past several years there has been increasing awareness of the need for practical tools to help transform the objective of a more socially inclusive and environmentally sustainable economic growth into reality. Some plans of action have been promoted by different international organizations (see, for example, UNDP's Strategy for Inclusive and Sustainable Growth, UNDP [2017]), or the Framework for Policy Action on Inclusive Growth, proposed by OECD (2018), which also lay the foundations for more sustainable growth). These plans frequently stress the necessity of fundamental changes in the pattern of economic growth, given that so far economic growth has not had desirable environmental or social outcomes. They tend to put forward a variety of policy initiatives, mostly in terms of structural reforms in product, labour and financial markets and with regard to tax and benefit systems.

It is common that policy action frameworks for inclusive and sustainable growth neglect the potential role of monetary policy in respect to distributional and environmental issues. Traditionally, monetary policy has been understood to be neutral with respect to real variables or nearly so in the longer term. Specific mandates of central banks generally prioritize price stability, while the possibility of contributing to goals such as those related to distributional or environmental aspects is only considered within the secondary objectives. However, each monetary policy intervention is by definition not neutral, creating winners and losers of the decisions made regarding inaction or other policy alternatives. Hence, all monetary policy actions have distributional and environmental consequences, affecting intra- and inter-generational equity. Some of the major areas of the ongoing debate on future monetary policy are precisely about its potential role in pursuing and contributing to reducing income and wealth inequality and combating environmental degradation and climate change (see, for example, Colciago et al., 2019; Honoban, 2019; Matikainen et al., 2017).

Although the goals of reduced income and wealth inequality and the mitigation of climate change would always inevitably be second-order issues for monetary policy in the face of objectives such as price stability, rethinking monetary policy in the light of the distributional-environmental challenges of our times and the 2030 Agenda of Sustainable Development can be highly relevant. It would not be possible to meet the SDGs without the joint involvement of civil society and state at all levels, and deploy, develop and coordinate old and new policy instruments. Moreover, monetary policy, despite its limitations, has proved to be one of the most powerful economic policies. In consequence, it is worth exploring its capabilities for reaching objectives other than those that have traditionally constituted the core of the mandate of most central banks.

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Chapter 2

Who takes the cake? The heterogeneous effect
of ECB accommodative monetary policy
across income classes

Who takes the cake? The heterogeneous effect of ECB accommodative monetary policy across income classes*

*Revised version (March 2024)***

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Abstract

This work provides evidence of the heterogeneous effects of the ECB's monetary policy across income classes. In particular, this investigation focuses on the labor market channel. Based on EU-SILC data, we estimate country-specific SVAR models to analyze the impact of the expansionary monetary policy shocks over the 2006-2019 period. The results suggest that monetary easing helped decrease unemployment rates for lower- and middle-income classes, to a larger extent for the former. This differential impact is accounted for a stronger improvement in job finding rates for classes located at the bottom of the income distribution. Conversely, the employment status of the upper class remained largely unaffected. The analysis identifies a positive impact of expansionary monetary policy on real labor income, which seems to have mostly benefitted the upper class. Overall, our results suggest that expansionary monetary policy helped decrease labor income inequality by exerting a stronger positive impact on lower-income households.

Key words: Monetary policy; income inequality; income class; structural vector autoregressions (SVARs); euro area.

JEL code: D31, E52

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1. Introduction

In recent years, there has been a growing concern regarding the status and prospects of the middle class in economically advanced countries. This concern arises from the observation that inequality has increased, and the middle class has lost considerable ground in numerous countries (see, e.g., Cowen, 2013; Vaughan-Whitehead, 2016; Pew Research Center, 2017). This dynamic has placed the question of income distribution at the forefront of economic analysis (see Stiglitz, 2012; Deaton, 2013; Piketty, 2014; Atkinson, 2015; Galbraith, 2016; etc.). Additionally, the emergence of theories challenging the notion that advanced economies inevitably progress towards more egalitarian societies, such as Piketty (2014), which opposes the widely refuted traditional view based on Kuznets (1955), has further fueled this debate. Numerous studies have recently delved into the determinants of income distribution to inform policymaking aimed at promoting equity. The deepening of globalization, skill-biased technological progress, demographic trends, changes in labor market institutions, financialization or the moderate ability of the tax-benefit systems to reduce market income inequality are among the major structural drivers examined in the literature (see e.g., OECD, 2011 and 2015; Dabla-Norris et al., 2015; Bourguignon, 2018).

The increasing within-country inequality and the deterioration of the middle class represent long-term trends primarily driven by profound and extensive structural changes. However, the unprecedented conventional and unconventional monetary measures implemented by most major central banks, including the European Central Bank (ECB), since the onset of the Global Financial Crisis (GFC) in 2007-2008 have significantly fueled discussions about the potential distributive implications of monetary policy among academics and policy makers. In fact, while monetary policy primarily targets price stability, its decisions are not neutral for income and wealth inequality.

From an academic standpoint, the distributive effects of monetary policy are not a novelty, and various theoretical channels through which monetary policy can affect income and wealth inequality have been discussed in the literature by several authors (Coibion et al., 2017, Ampudia et al., 2018). The distributive effects of monetary policy have also captured the attention of central bankers, who are concerned about the potential unintended consequences of their unconventional monetary policy decisions, which materialize through changes in the macroeconomic and financial environment (e.g.,

Bernanke, 2013, 2015; Yellen, 2014; Draghi, 2016; Constâncio, 2017). In advanced economies, the Bank of International Settlements (2022) notes a significant increase in the proportion of central bank speeches mentioning inequality since 2014.

According to Bernanke (2015), monetary policy is not a primary driver of the increase in inequality, as “monetary policy is neutral or nearly so in the longer term, meaning that it has limited long term effects on *real* outcomes like the distribution of income and wealth”. More recently, this traditional view proposing the neutrality of monetary policy over the business cycle is losing ground to the notion that cyclical and trend changes are hardly ever independent. Cyclical increases in inequality during economic downturns tend to be, in absolute terms, larger than the declines prompted by recovery phases. Consequently, by exerting a countercyclical effect, monetary policy might not only limit the short-term deterioration of inequality during recessions but also help reduce subsequent long-lasting scars (see e.g., Pereira da Silva et al., 2022).

Furthermore, amidst the recent shifts in the macroeconomic environment initiated during the COVID-19 crisis and further exacerbated by the subsequent global supply chain disruptions and the effects of the war in Ukraine, central banks are scaling back previous ultra-accommodative monetary policy stances to curb above-target inflation in advanced economies. The ongoing monetary tightening underscores the necessity of reassessing the impact past monetary easing tools had on inequality to fully comprehend what might be currently at stake and to initiate discussions about whether and how other policy areas (such as fiscal and structural policies) could help address potential forthcoming changes in labor income inequality.

This paper aims to contribute to the debate concerning the potential distributive implications of monetary policy transmission to income through the labor market. This research evaluates how monetary policy affects the different income classes by stimulating economic activity and employment in the set of countries that originated the Economic and Monetary Union (EMU-11). We differentiate between lower, lower-middle, upper-middle and upper classes and estimate country-specific structural vector autoregression (SVAR) models to assess possible impacts of monetary policy on the different income classes over the period between 2006 and 2019.

Our contribution is twofold. First, our proposal is among the first attempts in the literature (see also Corrado and Fantozzi, 2023, for the case of Italy) to empirically examine the effects of monetary policy using household survey (micro-level) data for the euro area. We generate class-specific labor market metrics and provide a deeper analysis that goes beyond the aggregate measures of inequality usually employed in this literature, which allows us to provide evidence of how both earnings heterogeneity and income composition channels work through the labor market.¹ Most previous studies rely on aggregate inequality measures such as the Gini index or metrics related to the income share of individuals at the top of the distribution compared to those at the bottom. Instead, we use cross-sectional data from EU-SILC and estimate the unequal incidence of monetary policy on employment status (i.e., extensive margin) and labor income (i.e., intensive margin) across income classes. Second, to further elucidate the mechanism behind the effect on the extensive margin, we use longitudinal data from EU-SILC and estimate the impact of expansionary monetary policy shocks on the job loss risk (i.e., job separation rate) and on the likelihood of finding a job (i.e., job finding rate).

Our findings indicate a non-uniform incidence of monetary policy shocks across income classes. On one hand, past accommodative monetary policy appears to have helped reduce unemployment rates for lower- and middle-income classes, while the impact on the upper-class is not statistically significant. However, the estimated reduction in the unemployment rate appears to be considerably larger for lower-income households, underscoring the substantially greater elasticity of poorer workers' employment status to policy shocks. This differential impact across income classes can be attributed to a significantly stronger improvement in job finding rates for those at the bottom of the income distribution. Conversely, job separation rates have been homogeneously affected across the distribution. On the other hand, we also identify a positive impact on real labor income, which, in this case, seems to have primarily benefitted the upper-income class. This investigation concludes that expansionary monetary policy seems to have helped decrease labor income inequality, as the positive impact via the extensive margin

¹ Note that the aim of this investigation is to understand the effects that expansionary monetary policy applied since the onset of the GFC may have had in terms of boosting economic activity and thus employment. Therefore, since the focus is on labour market income inequality, other effects related to the potential financial gains stemming from quantitative easing measures are not addressed in this analysis (see e.g., Saiki and Frost, 2014; Montecino and Epstein, 2015; and Mumtaz and Theophilopoulou, 2017).

(i.e., improving labor opportunities for the less affluent) has largely offset the comparatively minor increase in inequality driven by the intensive margin (i.e., improving real labor income earned by better-off households).

The remainder of the paper is structured as follows. Section 2 reviews the theoretical channels through which monetary policy affects income and wealth inequality and provides an overview of previous empirical evidence. Section 3 describes the data, while the empirical approach is elaborated in Section 4. Section 5 is dedicated to presenting and discussing the results derived from the analyses. Lastly, section 7 offers concluding remarks.

2. Literature review

2.1. Theoretical framework

Although the literature has traditionally focused more on the distributive effects of inflation than on the direct impacts of monetary policy on income inequality itself (Galli and von der Høeven, 2001; Albanesi, 2007), specific channels through which monetary policy might influence income and wealth distributions have been clearly identified (see e.g., Coibion et al., 2017, Amaral, 2017). Most of these channels primarily affect wealth distribution, either through inflation, such as the savings redistribution channel or the portfolio channel, or through the transmission process of monetary impulses, such as the interest rates exposure channel or the financial segmentation channel. However, there are two major channels exerting a direct impact on the distribution of income, namely, the income composition channel and the earnings heterogeneity channel.

The income composition channel focuses on the primary sources of household earnings and highlights that an expansionary monetary policy shock may exert a varying pressure on the different sources of earnings, for example, increasing financial asset prices more than salaries. Consequently, its effect on income may differ for agents who receive a larger fraction of their income from wage earnings (often situated at the lower end of the income distribution) compared to those who receive a larger portion of their income from capital returns and business gains (primarily higher-income households). Throughout the paper, we interpret this channel as the intensive margin of the labor market.

Regarding the earnings heterogeneity channel, it emphasizes that the risk of unemployment is unevenly distributed across the population, with the most vulnerable households typically facing higher

odds of being or becoming unemployed. Therefore, monetary policy is expected to affect the employment situation of the different income groups heterogeneously. Specifically, the employment status of households situated in the leftmost part of the income distribution tends to be more sensitive to the economic cycle and might therefore react more significantly to counter-cyclical monetary policy impulses. In this regard, an expansionary monetary policy shock that supports economic activity and employment could disproportionately benefit low- and middle-income classes, thereby reducing labor income inequality. This channel could be understood as the extensive margin of the labor market.

The relationship between monetary policy and inequality is bi-directional. While this research focuses on the potential effects of monetary policy on inequality, it must be noted that the literature is paying growing attention to the opposite causal relationship, namely how inequality might affect the effectiveness of monetary policy. In this regard, greater income inequality is associated with deeper and longer recessions, while it might also hamper the transmission of monetary policy (Kaplan et al., 2018). Overall, this literature suggests that the effect of monetary stimulus on the bottom part of the income distribution is crucial for the effective transmission of monetary policy, as its impact on aggregate consumption is mainly influenced by the reaction of households with a larger marginal propensity to consume (i.e., “hand-to-mouth” households).

2.2. Empirical literature

From an empirical standpoint, there is a substantial amount of work on the transmission mechanism of monetary policy and income inequality through the labor market (see e.g., Colciago et al., 2019 and Kappes, 2023). While earlier studies focused on the impact of the inflation channel on income and wealth distribution (see e.g., Easterly and Fischer, 2001; Doepke and Schneider, 2006; and Adam and Zhu), recent empirical studies on the redistributive implications of monetary policy shocks primarily focus on the earnings heterogeneity channel and the income composition channel. Some papers suggest that expansionary monetary policy might have helped reduce income inequality in various countries, including the U.S. (Bivens, 2015; Coibion et al., 2017), the U.K. (Mumtaz and Theophilopoulou, 2017), Italy (Casiraghi et al., 2018), Germany (Broer et al., 2022), Denmark (Andersen et al., 2022), Sweden (Amberg et al., 2022), the euro area (Guerello, 2018; Lenza and Slacarek, 2018), and a set of advanced and emerging countries (Furceri et al., 2018). They argue that

expansionary monetary policies stimulate economic activity, employment, and wages, particularly benefiting low-income households for which labor earnings constitute the main source of income. In contrast, high-income households are less likely to experience significant changes in employment status throughout the business cycle. In this regard, Heathcote et al. (2010) suggest that earnings at the bottom of the distribution are mainly affected by changes in hours worked and the unemployment rate, while earnings at the top are mostly affected by changes in hourly wages. Focusing on Germany, Broer et al. (2022) observe that job loss is more countercyclical for lower-earning households and conclude that expansionary monetary policy helps decrease labor income inequality largely by reducing the job separation rate of the poorer. Similar findings are reported for Denmark and Sweden. For the case of Denmark, Andersen et al. (2022) highlight that gains created by monetary policy through the labor channel are concentrated among relatively low-income workers. In a similar vein, Amberg et al. (2022) study the Swedish economy and conclude that the heterogeneity in the response of labor income across the income distribution is accounted for by the earnings heterogeneity channel, that is, due to a higher sensitivity of labor income to monetary shocks at the bottom than elsewhere in the distribution. Additionally, Lenza and Slacalek (2018) and Furceri et al. (2018), among others, evidence that the incidence of monetary policy on income inequality is asymmetric, with tightening policy raising inequality more than easing policy lowers it.

However, other studies find that expansionary monetary policy is associated with higher income inequality or that its distributive implications may be negligible. For instance, in Japan, Inui et al. (2017) reveal that expansionary monetary policy may disperse wages and increase income inequality due to labor market rigidities and nominal wage stickiness. O'Farrell et al. (2016) conclude that the distributive effects of expansionary monetary policy vary considerably across OECD countries, suggesting that they should be analyzed on a case-by-case basis.

From a somewhat different perspective, Dolado et al. (2021) examine the earnings heterogeneity channel using New Keynesian models, in which they study how capital-skill complementarity interacts with monetary policy in affecting inequality between high- and low-skilled workers. They find that unexpected expansionary monetary policy shocks may increase earnings inequality by lowering the labor share of income received by low-skilled workers and raising it for high-skilled workers, as they

increase capital demand, which then amplifies this wage divergence due to skilled workers being more complementary to capital than substitutable unskilled workers are. This way, in contrast to the arguments exposed above, monetary easing may favor the labor share of income received by high-skilled workers over low-skilled ones.

The sometimes-divergent results found in this literature underscore the importance of empirically addressing the impact of monetary policy on inequality in each case, considering socio-demographic, economic, and institutional dynamics that can play a significant role, such as the design of the labor market.

3. Data

3.1. Micro-level data from EU-SILC

To derive class-specific labor market metrics we use household survey data from the European Statistics on Income and Living Conditions (EU-SILC), which has been conducted since 2004 and serves as the source of reference for comparative statistics on income distribution in Europe.² The EU-SILC database offers the advantage of gathering detailed information on individual and household income, with data also being comparable across the participating European countries.³ We use data spanning from 2006 to 2019, encompassing the period from the GFC to the onset of the COVID-19 pandemic.

EU-SILC comprises two datasets: a cross-sectional dataset covering a specific period and a longitudinal dataset enabling the assessment of individual-level changes over time. The longitudinal dataset constitutes a rotational panel covering four years for most countries, with certain countries (namely France and Luxembourg) providing data for longer periods. Notably, Germany lacks a longitudinal database. Due to its larger sample size, the cross-sectional dataset is preferred and utilized for Analysis I (outlined in section 5.1), where we explore the impact of monetary policy on the

² Missing data on gross employee cash or near cash income for various countries in our sample forces us to shorten the time dimension and consider the period that ranges between 2006 and 2019.

³ EU-SILC is organized under a framework regulation and is thus compulsory for all EU Member States. EU-SILC is based on the idea of a “common framework” that is defined by a recommended design for implementing EU-SILC, and by common requirements (for imputation, weighting, sampling errors calculation), common concepts (e.g., household and income) and classifications (ISCO, NACE, ISCED) aiming at maximizing the comparability of the information produced.

unemployment rate and annual employee labor income across income classes.⁴ For this analysis, we look into a sample composed of the EMU-11 countries, namely Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Luxembourg, the Netherlands and Portugal. Despite the more sizeable sample of the cross-sectional dataset, we resort to the longitudinal dataset for Analysis II (presented in section 5.2.) to better understand the impact on unemployment. In particular, we study how monetary policy shocks affect the job separation and the job finding rates, for which we need over-time information on individuals' employment status. As the longitudinal dataset lacks data for Germany, this analysis focuses on the remaining ten countries mentioned above. Additional details regarding the datasets are available in Annex 1.

To assess the distributive implications of monetary policy on the income class structure, we adopt a relative definition of the income class based on thresholds relative to percentages of the median income. To delimit the lower-middle class, we consider the income limits that are conventionally accepted (see, e.g., Thurow, 1987; Birdsall et al., 2000; Ravallion, 2010; Atkinson and Brandolini, 2013): 75% and 125% of the median income. These cut-offs demarcate the lower-middle class as those 'comfortably' clear of being at-risk-of-poverty (below 60% of the median). Similarly, we define the upper-middle class as the share of the population whose income is between 125% and 200% of the median income. Households falling below 75% of the median income are categorized as lower class, while those above 200% constitute the upper class. The concept of income used to compute the limit of the income classes is disposable household income, as is usual in the delimitation of income classes. This includes, by definition, all income from work (salaries of employees and income of self-employed workers), income from capital and property, and transfers, while excluding taxes. Income data are collected with reference to the preceding calendar year, with Ireland being an exception among the analyzed countries.⁵

⁴ Note that we use annual employee labour income, therefore, changes in the intensive margin arise both from changes in work intensity (i.e., numbers of hours worked during the year) and changes in wages (i.e., remuneration per hour).

⁵ As argued by Böheim and Jenkins (2006), the differences in income reference periods are unlikely to be a major source of non-comparability across countries.

In EU-SILC, household serves as the basic unit for data collection and is commonly taken as the unit of measure. However, our analysis focuses on examining the income distribution of individuals, which constitutes our unit of analysis. Considering that an individual's well-being is affected not solely by their own personal income but also by the earnings of other household members and the household's composition, we utilize equivalent household income to categorize individuals into distinct income classes. Recognizing that household needs increase with each additional member, albeit not in a strictly proportional manner, we employ the concept of "equivalent" income to adjust household income according to its size, thereby assigning a value commensurate with its needs. Specifically, we employ the modified OECD equivalence scale to compute equivalent household income, a widely adopted approach throughout Europe.⁶ Subsequently, we assign the equivalent household income to each member of the household. For each income class delineated above, we calculate class-specific metrics including the unemployment rate, job separation rate, job finding rate and (mean) real labour income.⁷

The unemployment rate is defined as the ratio of unemployed individuals to the total number of active persons, encompassing both the employed and unemployed. The job separation rate refers to individuals newly transitioning from "employed" to "unemployed" status from one year to the next (divided by total active individuals), while the job finding rate reflects individuals transitioning from "unemployed" to "employed" status within the same timeframe. The job separation and job finding rates are computed using the longitudinal dataset, which allows us to track individuals over two consecutive years, identifying changes in their labour status. We identify the change in the labour status for each individual over the last two years of every longitudinal dataset corresponding to the waves of the analysed period. We then determine the job separation and job finding rates by employing the longitudinal weights to address attrition.

The concept of labour income used is gross employee cash or near cash income, that is, before transfers and taxes. By focusing on income before social transfers and taxes we aim to minimize the influence of the redistributive role of the tax and transfers system. However, examining solely market

⁶ A value of 1 to the first adult in the household, 0.5 to each remaining adult, 0.3 to each member younger than 14.

⁷ Nominal variables are deflated using the GDP deflator so as to be expressed in real terms (using 2015 prices).

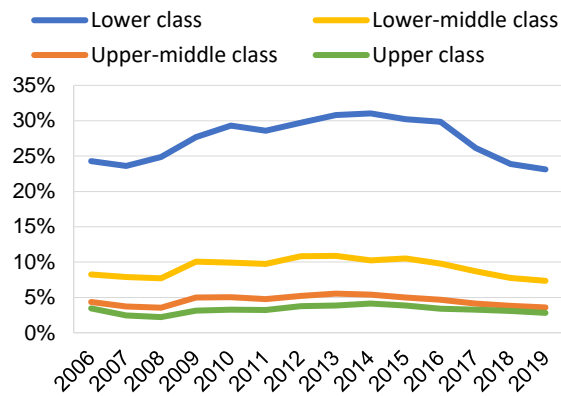
income would result in the exclusion of households entirely reliant on transfer payments, such as retirees who cannot be included in the analysis as their market income is close to zero in most cases. For this reason and given our interest in the effects of monetary policy via the labour market, we exclude from our sample those households whose market income is zero and simultaneously declare not to have active members. Therefore, while retirees (inactive members) relying on retirement pensions are not included, we do consider households composed by active members even if they are unemployed, as monetary policy might also affect them (see also Annex 2). While monetary policy might also impact income streams other than salaries, this research solely focuses on the labour market channel and thus does not consider the potential impact on business and capital gains. It also excludes the analysis of revenue received by the self-employed, who could be considered a hybrid type of earner, mixing features of workers and entrepreneurs, and receiving business and capital gains.

When examining the evolution of unemployment rate by income class (Figure 1), we observe how the burden of unemployment falls disproportionately on the lower-class, where unemployment rate has remained around 30% for the period between 2009 and 2016. Interestingly, the most vulnerable households seem to have been the first ones to exit the labour market when the recession started: the unemployment rate for the lower class began increasing already in 2008, while the first year-on-year increase appeared only in 2009 for the rest of the population. At the same time, these households seem to have been the last ones to re-enter the labour market during the recovery. In fact, while the unemployment rate for the upper classes started decreasing already in 2014-2015, the first decline is only observed in 2017 for the lower class (in 2016 for the lower-middle class). This “first-out, last-in” phenomenon present in the leftmost part of the income distribution, coupled with their comparatively largest increase in unemployment rate during the recession, helps explain the cyclical increase of labour income inequality and its persistence.

When considering the entire business cycle, including the full recovery up to 2019, we observe this cyclical deterioration disproportionately suffered by the lower class is not fully reversed. Instead, the post-crisis unemployment rate remains above the pre-crisis figures, leading to a scarring or hysteresis effect. Visually, this is represented by the slope of the lower-class best-fit-line in Figure 2, which differs both from the “full recovery” -45° line as well as from the slope estimated for the rest of

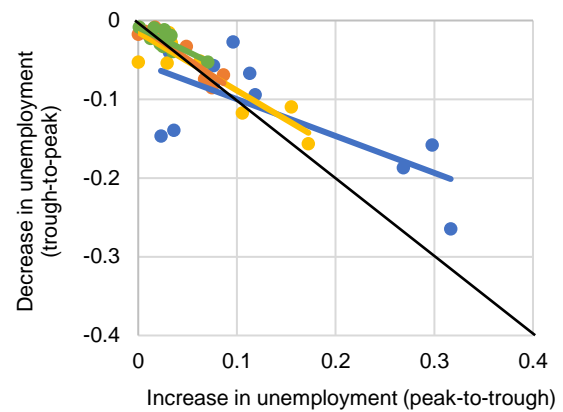
the population.⁸ This finding is aligned with Pereira da Silva et al. (2022), who uncover a similar dynamic also when examining advanced economies outside the euro area.

Figure 1. Evolution of unemployment rate by income class (2006-2019, %)



Source: EU-SILC (cross-sectional data) and authors' calculations. Note: Figure displays the weighted aggregate figures for the countries included in our sample (namely AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT) using active population as weights.

Figure 2. Scarring effect of unemployment rate by income class (2006-2019, pps)



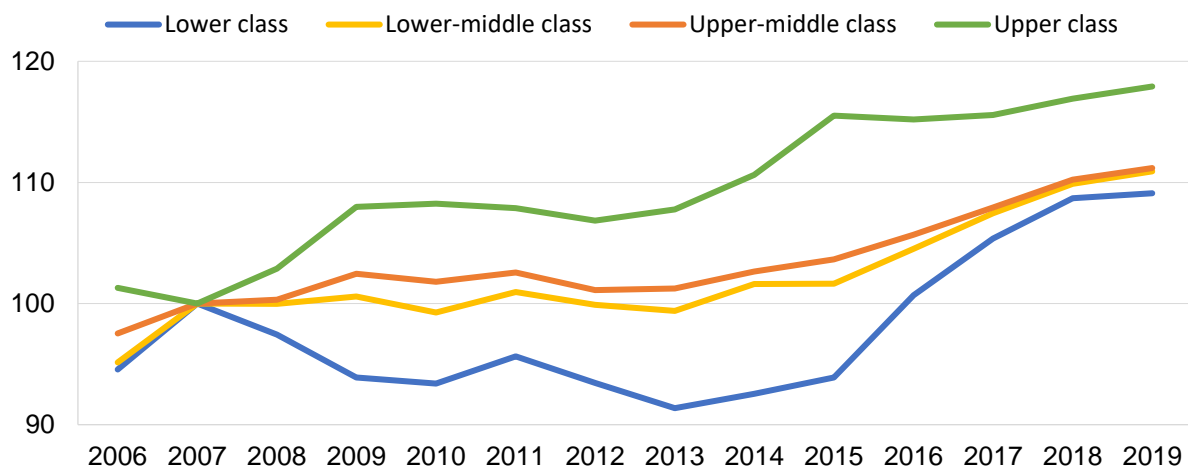
Source: EU-SILC (cross-sectional data) and authors' calculations. Notes: Dots in the figure represent each of the countries included in our sample (namely AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT). The increase in unemployment represented in the x-axis refers to the difference between the higher unemployment rate witnessed during the recession period (2008-2013) and the lowest unemployment rate during the pre-crisis period (2006-2007). The y-axis represents the sharpest decline in the unemployment rate during the post-crisis period (2014-2019), with respect to the largest value during the recession (2008-2013).

The evolution of the mean real labor income varies significantly across income classes. Overall, labor income remained rather stagnant between 2009 and 2013, with the recovery phase starting around 2014-2015 (see Figure 3). When compared to other income classes, the distinct behavior displayed by the real labor income earned by the lower class stands out, as labor income growth decreased and then stagnated for a longer period of time. In particular, it remained approximately 5-10% below pre-crisis levels for seven consecutive years and only started to recover in 2016. This extended period of stagnation reflects a lasting scarring effect, which contributed to a pronounced gap between the poorer and other income groups. This finding is aligned with Cockx and Ghirelli (2016) and Rothstein (2020), who document that the earnings of low-skilled workers and new entrants remain below pre-crisis levels more than ten years after the end of the recession. By 2018, the cumulative growth rate since 2007

⁸ Let us recall that the choice of the specific time frame, covering from the pre-crisis period (2006) until the year before the COVID-19 pandemic (2019), aims to capture the recovery phase before the negative macroeconomic impacts related to the pandemic. Furthermore, to allow for cross-country heterogeneity, on the chart we plot the country-specific changes in unemployment rates, which did not necessarily happen in the same year.

amounted to around 18% for the upper class and around 12% for the middle classes, while it remained below 10% for lower-class households. These dynamics highlight a notable widening of labor income dispersion throughout the recession period, which persisted above pre-crisis levels even after the recovery phase. Particularly noteworthy is the gap between the upper class and the rest of the population, which expanded around 2007-2009, continued to do so through 2014-2015 and persisted in 2019.

Figure 3. Evolution of real labor income by income class (2006-2019; index: 2007=100)

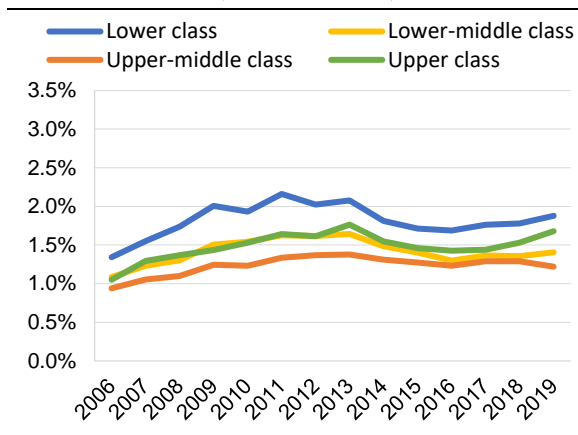


Source: EU-SILC (cross-sectional data) and authors' calculations. Notes: Figure displays the weighted aggregate figures for the countries included in our sample (namely AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT) using active population as weights. Nominal values are deflated using the country-specific GDP deflator (2015 prices). For each income class, the figure represents the evolution of the mean real labor income.

Figure 4 shows that the probability of becoming unemployed increased significantly during the recession years, this increase being larger for the lower class (0.8 percentage points from trough to peak) compared to the other income classes (around 0.5-0.6 percentage points). The job separation rate increased during the GFC and then began to decline progressively after the peak in 2011-2013. The parallel deterioration of the job finding rate followed a different dynamic: it declined abruptly in 2009 (-0.4 percentage points for the lower class, and around -0.25 percentage points for the others), remaining low throughout the recession, particularly for the most vulnerable households. While the job finding rate improved gradually for the middle and upper classes, the recovery only materialized in 2017 for the lower class.

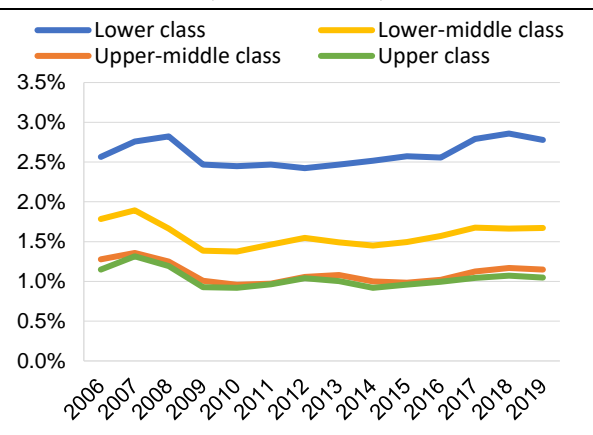
On average, both the job separation and the job finding rates are higher for the lower class, revealing the higher volatility of their employment status, as these workers are more likely to exit and re-enter the labor market. The higher job finding rate of the lower class (Figure 5) is also explained by their higher unemployment rate (Figure 1), as unemployed individuals are more likely to be found in the lower class.

Figure 4. Job separation rate by income class (2006-2019, %)



Source: EU-SILC (longitudinal data) and authors' calculations. Note: Figure displays the weighted aggregate figures for the countries included in our sample (namely AT, BE, ES, FI, FR, IE, IT, LU, NL, PT) using active population as weights. Data for DE is not available.

Figure 5. Job finding rate by income class (2006-2019, %)



Source: EU-SILC (longitudinal data) and authors' calculations. Note: Figure displays the weighted aggregate figures for the countries included in our sample (namely AT, BE, ES, FI, FR, IE, IT, LU, NL, PT) using active population as weights. Data for DE is not available.

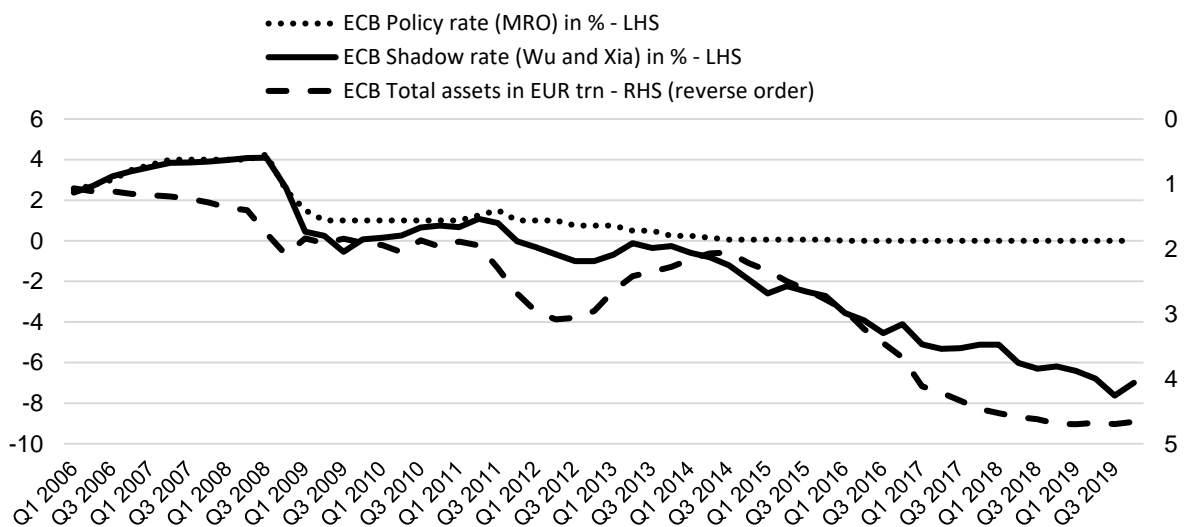
3.2. Macro-level data from various sources

In accordance with the literature (see, for example, Peersman, 2011 and Coibion et al., 2017), apart from the indicators derived from the EU-SILC microdata, we also include a series of macroeconomic variables as controls in our various models. In particular, we employ real gross domestic product, GDP_{it} , and also consider the evolution of prices by including the deflator of gross domestic product (referring to 2015 prices), $GDPdef_{it}$. To account for dynamics present in the financial markets, we also include in our models the Eurostoxx 600 prices, $StockPrices_t$ and the term spread between the euro area 10-year Government Benchmark bond yield and its 2-year counterpart, $TermSpread_t$.

Concerning monetary policy, it is commonly proxied either by short-term or policy interest rates (e.g., Furceri et al., 2018; Mumtaz and Theophilopolou, 2017; Coibion et al., 2017), central bank assets (Saiki and Frost, 2014; Guerello, 2018), or government bond spreads (Baumeister and Benati, 2010;

Ampudia et al. 2018; Lenza and Slacalek, 2018), particularly when intending to examine specifically unconventional monetary policy. To capture, as far as possible, the overall effects of the wide variety of monetary policy decisions adopted by the ECB since the onset of the financial crisis, including both conventional and unconventional monetary policy tools, we use the shadow rate from Wu and Xia (2020), $ShadowRate_t$. The shadow rate can be construed as the hypothetical short-term interest rate that would prevail in the economy if the effective lower bound were not binding. Authors infer the indicator from the term structure of interest rates so that it includes the information coming from longer-term interest rates, thereby reflecting unconventional monetary policy actions aimed at influencing the long end of the yield curve. As reflected in Figure 6, while at the beginning of our sample period the shadow rate perfectly co-moves with the conventional monetary policy rate applied to main refinancing operations, it also reflects the expansion of the ECB's balance sheet over the Quantitative Easing (QE) period when the shadow rate falls below zero.

Figure 6. Evolution of various monetary policy indicators (2006Q1-2019Q4)



Source: ECB Statistical Data Warehouse (SDW) and Wu and Xia (2020).

4. Empirical approach – Country-specific Vector Autoregression (SVAR) models

Macroeconomic analyses and policy evaluations require considering the interdependencies among the different economic variables to assess impacts from a global perspective and uncover causal relationships. The effects of monetary policies materialize through numerous transmission mechanisms,

giving rise to both direct and indirect impacts of a different nature. The existence of interactions between the analyzed variables constitutes the main reason why a simultaneous equation system appears to be an accurate way to approach our analysis. Initially developed by Sims (1980), the structural vector autoregression (SVAR) approach considers all variables to be endogenous and interdependent. The variables are included in the system as functions of lagged and present values of all endogenous variables, with the aim of tackling endogeneity issues as much as possible. SVAR models have become a pillar in empirical macroeconomic research and are widely used for multivariate time series analysis, including the investigation of the effects of monetary policy (see e.g., Bernanke et al., 2005; Sims and Zha, 2006). However, the use of SVAR methods has some limitations in capturing the complex dynamics of real-world economies. One limitation is that they rely on simplifying assumptions, as the set of covariates included in the model might not fully account for all relevant factors shaping income distribution and labor market dynamics. Another caveat, also related to the previous one, stems from the potential remaining endogeneity, as lingering endogeneity issues stemming from an imperfect model specification (and the existence of unobserved variables) cannot be fully excluded. Even though SVAR models are widely used to examine the distributive implications of monetary policy shocks, this approach is not well-equipped for studying multiple distributional channels, and analyses usually aim to tackle, either fully or partially, one or two transmission mechanisms. In our case, we aim to address the effects of the earnings heterogeneity and income composition channels that operate through the labor market. Notwithstanding these caveats, a stream of literature employs large-scale microeconomic models to complement and overcome some of the constraints related to multivariate time-series analyses (see e.g., Casiraghi et al., 2018, and Bunn et al., 2018). In the area of dynamic stochastic general equilibrium models, a growing number of researchers are capturing the interplay between inequality and monetary policy via New Keynesian models with heterogeneous agents (HANK). These authors highlight that the distributive implications of monetary policy shocks largely depend on the marginal propensity to consume of hand-to-mouth households, which shapes their more sizeable reaction to monetary policy decisions compared to other income classes (see e.g., Kaplan et al., 2018, and Ampudia et al., 2018; Dolado et al., 2021).

The dynamic interactions among the set of macroeconomic endogenous variables collected in the vector Y_t , ($g \times 1$) are governed by the following system of autoregressive simultaneous equations in reduced form:

$$Y_t = C + A_1 Y_{t-1} + A_2 Y_{t-2} + \dots + A_p Y_{t-p} + \varepsilon_t \quad (1)$$

$$Y_t = C + \sum_{j=1}^p A_j Y_{t-j} + \varepsilon_t \quad (2)$$

$$\varepsilon_t \sim N(0, \Sigma_\varepsilon) \quad (3)$$

where $t = 1, \dots, T$, indicates times with $T = 56$ quarters from 2006Q1 to 2019Q4. Here C denotes a ($g \times 1$) vector of constants, and A_j are ($g \times g$) matrices of coefficients on the p lags of the variables, where $p = 8$ is the optimal number of lags, which stems from the Akaike Information Criterion. ε_t is an error process which is assumed to be white noise with zero mean and to have a time invariant covariance matrix, Σ . The vector Y_t includes 7 endogenous variables; therefore g is equal to 7 for each of the four models corresponding to each of the four income classes. Four models (one per income class) are estimated for each of the countries of our sample, while charts throughout section 5 plot the aggregated results (using real gross domestic product as weight).⁹ The source and the transformation of the different variables included in the models can be found in Annex 3. The set of class-specific variables vary for each of the analyses:

- **Analysis I** (based on EU-SILC cross-sectional data), where the vector of endogenous variables, Y_t , is composed of: (i) GDP, (ii) GDP deflator, (iii) stock prices, (iv) term spread, (v) shadow rate, (vi) unemployment rate, and (vii) real labor income.
- **Analysis II** (based on EU-SILC longitudinal data), where the vector of endogenous variables, Y_t , is composed of: (i) GDP, (ii) GDP deflator, (iii) stock prices, (iv) term spread, (v) shadow rate, (vi) job separation rate, and (vii) job finding rate.

The estimation of the structural VAR might be biased due to the large number of parameters coupled with the rather limited temporal availability, which might lead to over-parametrization, thus

⁹ Let us recall that, due to data availability in EU-SILC, Analysis I (section 5.1) includes AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, and PT, while Analysis II (section 5.2) excludes DE, thereby considering AT, BE, ES, FI, FR, IE, IT, LU, NL, and PT.

biasing the results due to the trade-off between the length of the sample and model accuracy. To overcome this limitation, commonly referred to as the curse of dimensionality, we use a Bayesian approach to estimate VAR models with sign restrictions, following Rubio-Ramirez et al. (2010). The choice of the degree of informativeness implied by the foregoing is approached in a data-based fashion via hierarchical modelling in the spirit of Giannone et al. (2015). More specifically, the hyperparameters of the prior distributions are treated as additional random parameters to be estimated in the model.¹⁰

While the macroeconomic and financial variables are available at a quarterly frequency, this is not the case for the household survey data from EU-SILC. To solve this mixed-frequency problem, we perform a regression-based temporal disaggregation so as to convert the low frequency data (annual data) into a higher-frequency (quarterly data). In particular, we use quarterly data on GDP growth rate and aggregate unemployment rate (at country-level) to disaggregate the class-specific metrics on unemployment rate, and job separation and job finding rates. For real labor income, we follow the same approach using as regressors the real GDP per capita and the aggregate compensation by employee in real terms (at country-level). The underlying implicit assumption is that the annual relationship between the variables also holds intra-annually. This disaggregation approach is also used to extend the data on real labor income for the period 2019Q1-2019Q4, as this variable was only available until 2018 at the time we performed the analysis.

The reduced-form VAR system above (equations 1 to 3) does not account for direct contemporaneous relationships among the variables, as there are no contemporaneous endogenous variables on the right-hand side. In fact, the error terms in the reduced form are typically correlated (matrix Σ tends to have non-zero off-diagonal elements), and thus this form does not have a clear economic interpretation. To derive a meaningful interpretation of the impulse response functions, we perform the identification via sign restrictions, which rely on expectations about the response directions of the variables following certain shocks (Rubio-Ramirez et al., 2010). Our aim is to estimate the effect of monetary policy, for which we identify an exogenous expansionary monetary policy shock and trace

¹⁰ The estimate of the models is done via the Bayesian Estimation, Analysis and Regression toolbox (BEAR) developed by Dieppe et al. (2016) and made available via the European Central Bank website.

the response over time of the different endogenous variables. The main identifying assumption is that an expansionary monetary policy shock (defined as a negative orthogonal deviation in the shadow rate) has a positive impact on inflation (measured via the GDP deflator) and stock prices, while decreasing the term spread. Regarding the macroeconomic environment, an expansionary monetary policy is expected to exert a positive impact on the real economy (real GDP), while the class-specific variables related to the labor market are left unrestricted. The identifying assumptions are imposed contemporaneously (i.e., on impact, for the same period in which the shock materializes) and one period-ahead. As a cross-validation check, we also use an alternative identification strategy via zero restrictions using the Cholesky decomposition (the associated restrictions and estimates can be found in Annex 4).

5. Results

5.1. Analysis I – Focus on unemployment rate and labor income

First, country specific SVAR models are estimated for each of the income classes using sign restrictions (results presented throughout Figures 7, 8, 9 and 10, and Tables 1 and 2), while additional estimates using triangular factorization are provided as a robustness check in Annex 4 (results presented throughout Figures A4.1, A4.2, and A4.3). Figure 7 shows that an expansionary monetary policy shock, equivalent to a one-percentage-point decrease in the shadow rate, is associated with long-lasting changes in inflation. Specifically, it appears to be linked to an increase in the gross domestic product deflator by approximately 0.12-0.15%. Moreover, the term spread seems to correlate with the shock, exhibiting a negative peak response of -0.1 percentage points approximately four quarters after the shock. Stock prices also appear to increase by around 2.5-3.5% during the first year after the shock. Real gross domestic product remains 0.3-0.5% above its pre-shock level for at least sixteen quarters after the shock.

Figure 8 highlights that the estimated response of the unemployment rate to a monetary easing shock varies significantly across income classes. Particularly, the lower class displays the most substantial change in magnitude, remaining approximately -0.5 percentage points below the initial value during the second and third year after the shock (i.e., between the seventh and the thirteenth quarter).

The magnitude of the response diminishes as one moves up through the income strata, with the unemployment rate showing a reduction of around -0.2 percentage points for the lower-middle class, and between -0.1 and -0.15 for the upper-middle class. In contrast, the unemployment rate for the upper class does not seem to change significantly with the monetary policy shocks. This indicates that the increased economic activity promoted by expansionary monetary policies is associated with more employment opportunities, which seem to have been unevenly distributed among the different income classes. In fact, these changes seem to particularly favor households in the lower-income class, as they appear to have captured most of the generated employment.

These findings suggest that, over the past economic cycle, monetary easing might have potentially contributed to the containment of income inequality via the extensive margin of the labor market. However, the positive contribution to the reduction of the unemployment rate suffered by the lower class appears to vary significantly across countries, being particularly sizeable for Ireland, Spain, Italy, and Portugal, in contrast to the Netherlands, Austria, Germany and Finland, which exhibit more moderate changes (see Table 1). These disparities are linked to differences in labor market dynamics across countries. Specifically, countries that suffered larger increases in the unemployment rate during the recession are those for which our analysis identifies larger impacts. The status of lower-income workers tends to be more sensitive to the economic cycle in the first group of countries mentioned above due to factors related to the flexibility and the sectoral specialization of the labor market.

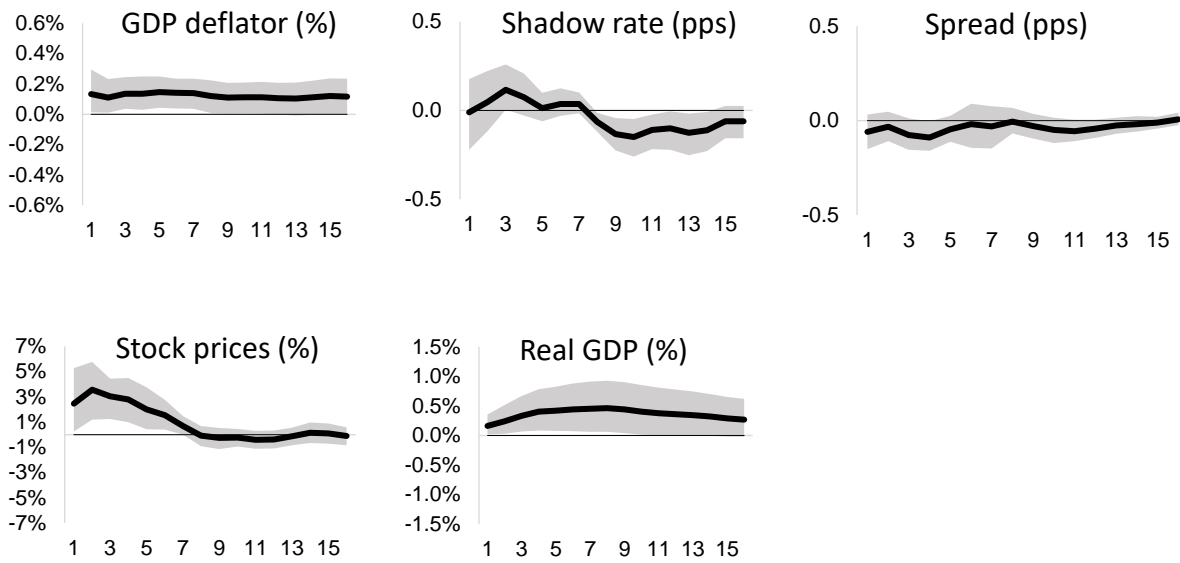
Figure 9 presents the estimated impulse-response functions (IRFs) for the case of real labor income. First and foremost, this analysis reveals that the labor income perceived by the lower and lower-middle classes has not been significantly affected by monetary shocks. For the other income classes, the results present a mixed picture both in terms of magnitude and time evolution. On one hand, the upper-middle class appears to experience an increase in labor income, although this association appears to be gradual and only becomes significant in the long run, approximately eight quarters after the shock. At its peak, this increase is as high as 0.25-0.35%. In contrast, the IRF pattern for the upper class shows that labor income for these households increases three quarters after the shock, with income approximately 0.4% higher than they would otherwise be. Notably, upper classes in Spain, France, Ireland, Italy and Luxembourg appear to benefit particularly from this effect (see Table 2). Overall,

expansionary monetary policy might be linked to an exacerbation of income inequality via the intensive margin, as higher-income classes seem to experience a larger positive effect. Conversely, annual labor income accrued by the most vulnerable households seem to be largely unresponsive to expansionary monetary policy shocks.

This analysis leads to the conclusion that expansionary monetary policy seems to be associated with a reduction in income inequality via the extensive margin (i.e., unemployment rate) of the labor market, while it appears to correlate with increasing disparities across income classes via the intensive margin (i.e., annual labour income or annual salary). Using the country-specific peak coefficient of the impulse-response functions estimated in the SVAR models (see Tables 1 and 2), we compute the implications for labor income by income classes. This result indicates that a negative shock to the shadow rate equivalent to a one-percentage-point decrease is associated with an increase in the labor income of circa 1% for the lower class (Figure 10). This result is largely explained by changes in the unemployment rate (i.e., the extensive margin). In comparison, changes in the labor income are much lower and stay between 0.4% and 0.5% for the other income classes. In contrast, the role played by the intensive margin increases as we move towards the higher end of the income distribution. Considering the overall implications for all income classes, and in line with Lenza and Slacalek (2018), our results suggest that expansionary monetary policy seems to be linked to a decrease in income inequality, as the inequality-decreasing response of the extensive margin of the labor market appears to predominate.

Figure 7. Analysis I – Estimated IRFs to an expansionary monetary policy shock (1/3)

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)

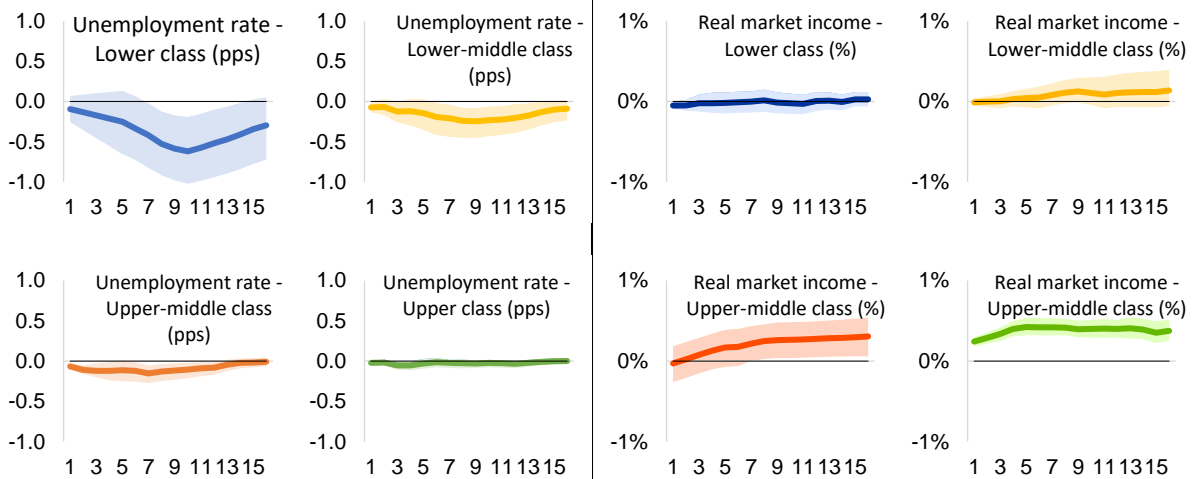


Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock. Charts present the results aggregated for all countries in the sample (namely, AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT) using as weight the average real gross domestic product during the period between 2006 and 2019.

Figure 8. Analysis I – Estimated IRFs to an expansionary monetary policy shock (2/3)

Figure 9. Analysis I - Estimated IRFs to an expansionary monetary policy shock (3/3)

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock. Charts present the results aggregated for all countries in the sample (namely, AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT) using as weight the average real gross domestic product during the period between 2006 and 2019.



Table 1. Analysis I – Country-specific peak impulse-response coefficient for unemployment rate

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)

		AT	BE	DE	ES	FI	FR	IE	IT	LU	NL	PT
Response of unemployment rate	Lower class	-0.42	-0.52	-0.37	-0.97	-0.36	-0.43	-2.11	-0.87	-0.60	-0.18	-0.80
	Lower-middle class	-0.19	-0.18	-0.13	-0.35	-0.26	-0.15	-1.19	-0.42	-0.29	-0.08	-0.24
	Upper-middle class	-0.13	-0.12	-0.09	-0.12	-0.22	-0.09	-0.83	-0.11	-0.31	-0.06	-0.18
	Upper class	-0.04	-0.04	-0.04	-0.05	-0.07	-0.02	-0.25	-0.04	-0.09	-0.04	-0.08

Note: Figures other than zero are deemed to be significant (i.e., within the 90% confidence bands).

Table 2. Analysis I – Country-specific peak impulse response coefficient for real labor income

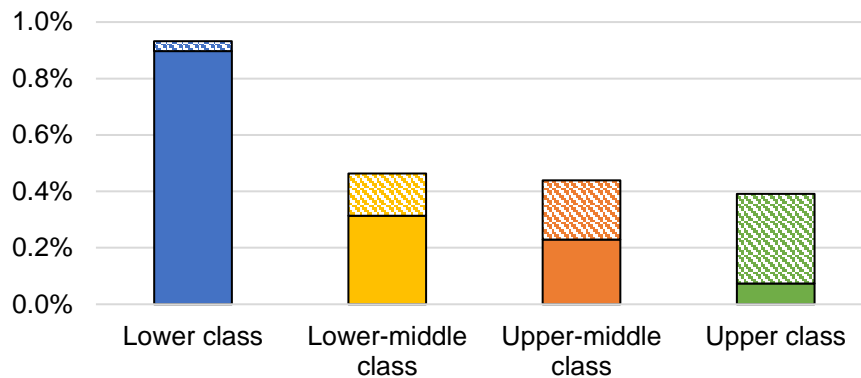
(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)

		AT	BE	DE	ES	FI	FR	IE	IT	LU	NL	PT
Response of real labour income	Lower class	0.02%	0.04%	0.00%	0.00%	0.04%	0.05%	0.07%	0.00%	0.00%	0.04%	0.00%
	Lower-middle class	0.00%	0.19%	0.00%	0.00%	0.15%	0.14%	0.23%	0.00%	0.00%	0.00%	0.03%
	Upper-middle class	0.18%	0.12%	0.32%	0.33%	0.18%	0.17%	0.18%	0.11%	0.33%	0.12%	0.18%
	Upper class	0.37%	0.19%	0.26%	0.66%	0.25%	0.54%	0.43%	0.50%	0.50%	0.16%	0.30%

Notes: Figures other than zero are deemed to be significant (i.e., within the 90% confidence bands). Not significant responses are shaded in grey.

Figure 10. Analysis I - Decomposition of the overall impact on mean labor income (in real terms) into the extensive (solid bars) and the intensive margins (dashed bars)

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Figures display the total effect for all countries (EMU-11) comprising our sample. Impacts used for the computation are the peak impacts estimated via the Bayesian SVAR set up with sign restrictions. The chart presents the aggregate results including all countries in the sample (namely, AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT)

5.2. Analysis II – Focus on job separation rate and job finding rate

The preceding analysis highlights that monetary policy shocks appear to be associated with changes in the labor market primarily linked to the responsiveness of the unemployment rate, particularly prominent for the lower class. In this subsequent analysis, we delve deeper to ascertain the extent to which this association is driven by the reaction of the job separation rate (i.e., employed people becoming less likely to lose their jobs) or rather relates to the job finding rate (i.e., unemployed people

becoming more likely to find a job). As in the previous section (Analysis I), we estimate country-specific SVAR models for each income class, employing both sign restrictions (see Figures 11, 12, 13, and 14, and Tables 3 and 4) and triangular factorization as a cross-validation test (results presented in Figures A4.4, A4.5, and A4.6).

Figure 11 illustrates the impulse response functions for the set of macro variables encompassed in the models. Analogous to our observations in Analysis I (Section 5.1), an expansionary monetary policy shock equivalent to a one-percentage-point negative deviation in the shadow rate is associated with a lasting increase in the GDP deflator of approximately 0.15-0.20%. The change in the term spread hovers around -0.05 and peaks five quarters after the shock. Stock prices remain 3-4% above pre-shock levels during the first year, while the real gross domestic product registers an increase of around 0.5%.

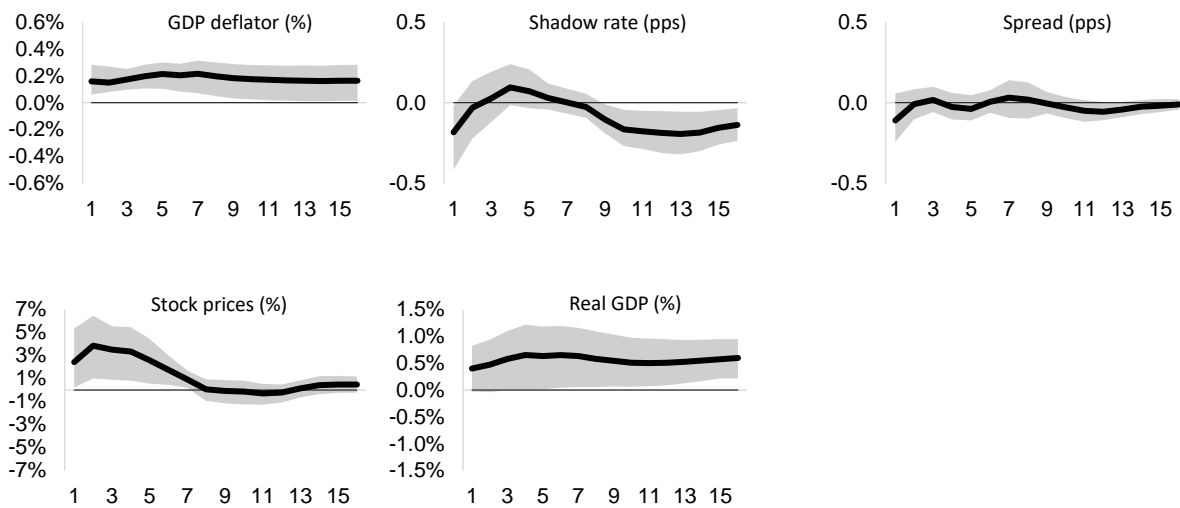
The response of the job separation rate to a monetary easing shock varies across income classes, with particularly significant effects observed for the most vulnerable households (Figure 12). For the lower and the lower-middle classes, the rate is approximately -0.025 percentage points lower four to five quarters after the shock. Although smaller in magnitude, the changes in the upper-middle and upper classes become statistically significant during the second year (ranging between -0.015 and -0.02 percentage points). In line with the variation in the unemployment rate (see Table 1), the changes in the job separation rate are notably pronounced for Ireland, Italy, Spain, and Portugal, contrasting with the more moderate variations observed in the Netherlands, France and Finland (Table 3).

While the IRF suggests that the reaction of the job separation rate becomes evident during the second year after the shock, the positive response of the job finding rate materializes later in time, during the third year (Figure 13). The contribution is again more pronounced for the lower class, where the change stands at 0.02 percentage points, above the one estimated for the middle classes (ranging between 0.01 and 0.015 percentage points). The increase in the job finding rate for the upper class appears relatively sluggish, becoming statistically significant twelve quarters after the shock (around 0.005-0.01 percentage points). Across countries, variations in the job finding rates appear to be more substantial for Ireland, while being relatively similar for Austria, Spain, Finland, Italy, Luxembourg, the Netherlands and Portugal. Conversely, Belgium, and France exhibit less association between the transition from unemployment to employment and monetary policy shocks (Table 4).

The findings of Analysis II suggest monetary easing positively correlates with a reduction in labor income inequality via both a decrease in the risk of job loss and an increase in the probability of finding a job, with larger changes observed for individuals located on the leftmost side of the income distribution (Figure 14). The positive contribution via the reduction in the job separation rate helps explain the overall decline in the unemployment rate, with a more significant impact observed for the lower class, albeit relatively similar impacts are observed for the middle and upper classes. Furthermore, variations in the job separation rate also appear to elucidate most of the heterogeneity in the response of the extensive margin across countries. Regarding the job finding rate, the change appears relatively consistent across countries but notably heterogeneous across income classes, increasing as we progress towards the lower end of the distribution, thus contributing to a reduction in labor income inequality. The lower magnitude of the response estimated for the upper- and upper-middle classes complements and reinforces the previous findings in Analysis I, which indicated a more moderate variation of the extensive margin for better-off households.

Figure 11. Analysis II – Estimated IRFs to an expansionary monetary policy shock (1/3)

(-1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock. Charts present the results aggregated for all countries in the sample (namely, AT, BE, ES, FI, FR, IE, IT, LU, NL, PT) using as weight the average real gross domestic product during the period between 2006 and 2019.



Figure 12. Analysis II – Estimated IRFs to an expansionary monetary policy shock (2/3)

Figure 13. Analysis II – Estimated IRFs to an expansionary monetary policy shock (3/3)

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock. Charts present the results aggregated for all countries in the sample (namely, AT, BE, ES, FI, FR, IE, IT, LU, NL, PT) using as weight the average real gross domestic product during the period between 2006 and 2019.

Table 3. Analysis II – Country-specific peak response of job separation rate

(-1 percentage point shock to an orthogonal deviation in the shadow rate)

		AT	BE	ES	FI	FR	IE	IT	LU	NL	PT
Response of job separation rate	Lower class	-0.02	-0.02	-0.04	-0.02	-0.02	-0.06	-0.04	-0.03	-0.02	-0.04
	Lower-middle class	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.02	-0.02
	Upper-middle class	-0.01	-0.01	-0.01	-0.01	-0.01	-0.05	-0.01	-0.02	-0.01	-0.02
	Upper class	-0.01	-0.01	-0.01	-0.01	-0.01	-0.03	-0.01	-0.02	-0.01	-0.02

Notes: Figures other than zero are deemed to be significant (i.e., within the 90% confidence bands).

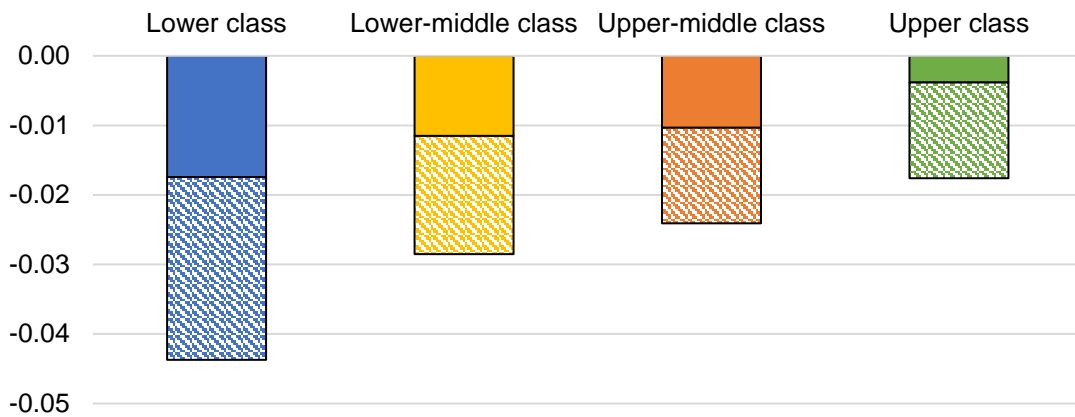
Table 4. Analysis II – Country-specific peak response of job finding rate

(-1 percentage point shock to an orthogonal deviation in the shadow rate)

		AT	BE	ES	FI	FR	IE	IT	LU	NL	PT
Response of job finding rate	Lower class	0.02	0.01	0.02	0.02	0.01	0.05	0.02	0.02	0.02	0.02
	Lower-middle class	0.01	0.01	0.01	0.02	0.01	0.03	0.01	0.02	0.01	0.01
	Upper-middle class	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Upper class	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01

Notes: Figures other than zero are deemed to be significant (i.e., within the 90% confidence bands).

Figure 14. Analysis II - Decomposition of the overall impact on (proxy) unemployment rate into the job finding (solid bars) and the job separation rate (dashed bar)
 (-1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Figures display the total effect for all countries comprising our sample. Impacts used for the computation are the peak impacts estimated via the Bayesian SVAR set up with sign restrictions. The chart presents the aggregate results including all countries in the sample (namely, AT, BE, ES, FI, FR, IE, IT, LU, NL, PT)

6. Conclusions

This study examines the impact of the ECB's expansionary monetary policy across income classes in the countries comprising the EMU-11 during the period between 2006Q1 and 2019Q4. Specifically, using household survey microdata from EU-SILC, we calculate class-specific unemployment rates, job separation and job finding rates, and labor income. Additionally, we examine the implications of monetary policy on different income classes. Our analyses reveal that an expansionary monetary policy shock appears to be associated with a boost in real gross domestic product, a decrease in the unemployment rate, and an increase in labor income. Notably, these changes exhibit high heterogeneity both across income classes and countries.

In terms of employment status, a monetary easing shock seems to be linked to an increase in employment for individuals at the lower end of the income distribution. However, the decline in the unemployment rate appears to be comparatively less pronounced for lower-middle and upper-middle households, while the unemployment rate of the upper class seems to remain unaltered. Regarding the underlying dynamics, we observe a significant improvement in job finding rates, which predominantly benefits lower-income households. Conversely, the estimated changes in job separation rates appear to be rather homogeneous across income classes. Overall, our findings suggest that expansionary monetary

policy shocks are associated with a reduction in labor income inequality primarily through increased employment among lower-income workers (i.e., via the extensive margin).

Turning to labor income, we observe two key findings. First, most vulnerable households do not appear to experience an increase in their salaries following a monetary easing shock. Secondly, labor income for middle classes only significantly increases in the medium to long run, whereas for the upper class, the increase materializes earlier. The finding that employee compensation accrued by the low-income class has remained largely unresponsive to countercyclical monetary policy helps partially explain a stylized fact outlined in the text: the increase in salary dispersion during the recession was not fully reversed in the recovery phase. In this regard, our results suggest that past expansionary monetary policy may be linked to an exacerbation in labor income inequality via the intensive margin.

Overall, when considering changes in both the extensive (i.e., unemployment rate) and the intensive margin (i.e., labor income), the former appears to dominate due to the higher sensitivity of employment to monetary shocks among lower-income households compared to elsewhere in the distribution. In fact, our analysis suggests that the employment status of households at the lower end of the income distribution tends to be more sensitive to the economic cycle, thus reacting more significantly to counter-cyclical monetary policy impulses. Hence, this research reveals that the additional labor income associated with expansionary monetary policy appears to have particularly benefitted low-income workers, thereby reducing labor income inequality.

While these findings hold qualitatively for all countries in our sample, our analyses uncover significant differences across countries. Broadly, results from country-specific models allow us to differentiate between two groups in terms of the size of the effects, largely influenced by differing national economic and institutional environments, as well as labor market dynamics.

Among the countries where estimated impacts on the extensive margin appear more prominent, we find Southern European countries (Italy, Spain and Portugal), which experienced the most severe and prolonged downturns in terms of unemployment following the GFC. In these countries, the crisis primarily affected small and medium-sized firms, with strong impacts on the service sector, where human capital tends to be less firm-specific, and firms are more inclined to reduce their labor force rather than adjust the intensive margin. This amplified the sensitivity of the employment rate to the

economic cycle, thereby exacerbating the consequences of the crisis. The domestic weaknesses of these countries, together with the different reforms that were carried out to increase the flexibility of their labor markets, may also help understand their larger reaction to monetary policy shocks. Likewise, the relatively subdued estimated response of salaries for the lower class in these countries may be associated with the measures aiming at reduced labor costs and the centralization of collective bargaining in the wage-setting system (see also, e.g., Izquierdo et al., 2017, and Ehmer and Schwegmann, 2017).

A similar situation occurred in Ireland, considered one of the most flexible labor markets in Western Europe before the recession. Following the onset of the GFC, Ireland witnessed a sharp rise in unemployment rates that soared to unprecedented levels, largely driven by the collapse in construction activity and widespread layoffs across various sectors. Stimulus packages, job creation initiatives and support for the unemployed aimed at enhancing labor market flexibility played a role in the subsequent recovery, potentially explaining as well the larger sensitivity to expansionary monetary policy shocks.

Conversely, countries that experienced comparatively less severe economic impacts during the GFC, such as Austria, Belgium, Finland and Germany, exhibited less intense declines in employment and returned to positive economic growth paths shortly after the crisis. These countries were less inclined to reduce labor input during the recession phase, leading to lower rates of transitions both towards unemployment and back towards employment during the recovery phase.

Indirectly, this research also highlights two crucial potential challenges for the ECB's single monetary policy, which stem from the unequal consequences of economic shocks across euro area countries: divergent economic cycles and structural differences. While the former resulted in unequal magnitude and persistence of the GFC and the subsequent recovery, the latter also influenced the extent to which counter-cyclical monetary policy could effectively stimulate aggregate demand and boost employment.

Finally, it should be emphasized that our findings broadly align with the official standpoint of most central bankers, who acknowledge expansionary monetary policy may help reduce income inequality by stimulating economic activity and employment during demand-driven recessions. This way, beyond value judgments regarding whether monetary policy should incorporate considerations of economic inequality, our analysis underscores the critical need for policymakers to earnestly weigh the

differential impacts of monetary stimulus on households across the income distribution. This nuanced understanding highlights the varying implications of monetary policy for employment and labor income among the different income classes, urging policymakers to consider such insights when examining the multitude of factors influencing income distribution within their decision-making processes.

ANNEX

Annex 1. Additional information on EU-SILC databases

Table A1.1. Cross-sectional dataset

Years	Number of observations
2006	210458
2007	203405
2008	200837
2009	201706
2010	197628
2011	199351
2012	190837
2013	191504
2014	185740
2015	196452
2016	192223
2017	182466
2018	186403
2019	208460

Table A1.2. Longitudinal dataset

Years	Number of observations
2006-2007	125366
2007-2008	129162
2008-2009	125273
2009-2010	127139
2010-2011	136657
2011-2012	129654
2012-2013	130581
2013-2014	132461
2014-2015	131672
2015-2016	136648
2016-2017	134775
2017-2018	130905
2018-2019	115837

Table A1.3. Descriptive statistics of variables in the cross-sectional file

	Mean	SD	Min	Max
Low-class mean labor income	7084.9	2094.0	2422.0	22223.8
Lower-middle-class mean labor income	18530.6	5086.8	6052.9	40995.7
Upper-middle-class mean labor income	31121.1	8617.8	10622.6	68248.9
Upper-class mean labor income	49267.7	13828.9	24882.0	123446.4
Low-class unemployment rate	27.0%	0.09	3.9%	55.8%
Lower-middle-class unemployment rate	8.8%	0.06	1.0%	27.0%
Upper-middle-class unemployment rate	4.3%	0.03	0.8%	14.3%
Upper-class unemployment rate	3.1%	0.02	0.3%	9.6%

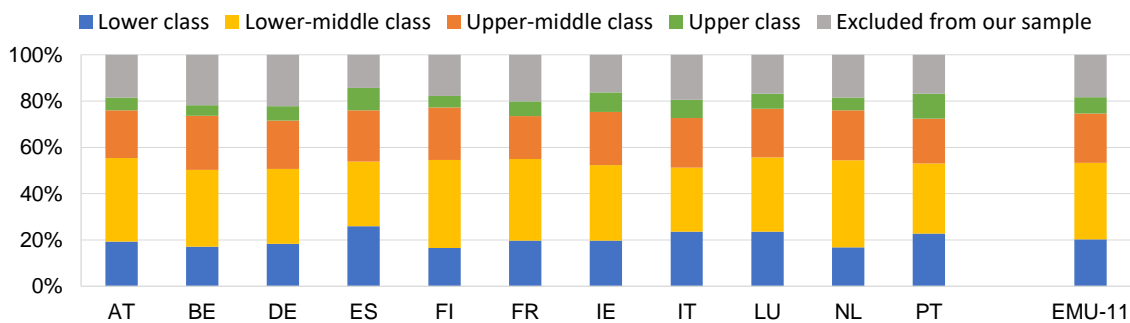
Source: EU-SILC *Cross-sectional UDB*, 2007-2020.

Table A1.4. Descriptive statistics of variables in the longitudinal file

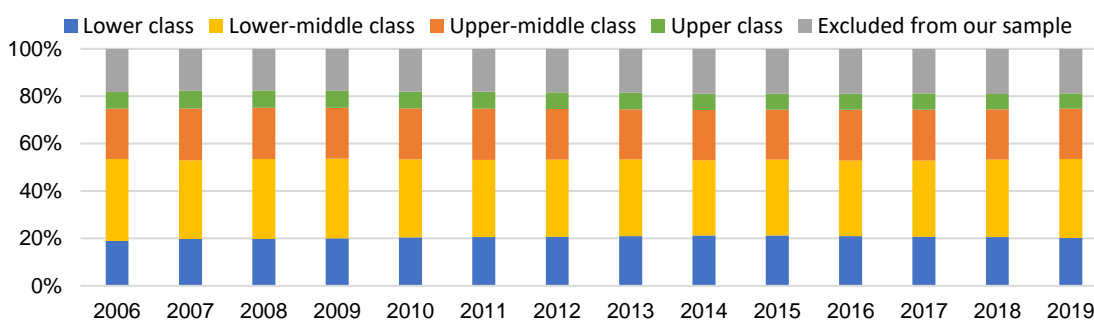
	Mean	SD	Min	Max
Low-class job-separation rate	1.9%	0.005	1.1%	4.5%
Lower-middle-class job-separation rate	1.4%	0.003	0.8%	2.6%
Upper-middle-class job-separation rate	1.3%	0.003	0.5%	1.9%
Upper-class job-separation rate	1.6%	0.003	0.7%	2.6%
Low-class job-finding rate	2.7%	0.011	1.6%	8.3%
Lower-middle-class job-finding rate	1.5%	0.003	1.1%	2.9%
Upper-middle-class job-finding rate	1.1%	0.002	0.5%	1.8%
Upper-class job-finding rate	1.0%	0.003	0.3%	1.9%

Source: EU-SILC *Longitudinal UDB*, 2008-2020

Annex 2. Percentage of population represented by each income class

Figure A2.1. Average percentage of population per income class by country

Source: EU-SILC *Cross-sectional UDB*. Note: Figures represent 2006-2019 averages.

Figure A2.2. Average percentage of population per income class by year

Source: EU-SILC *Cross-sectional UDB*. Note: Figures represent averages across countries.

Annex 3. Database

Variable	Source	Transformation
Gross domestic product (GDP)	Eurostat	Log-levels
Deflator of GDP (2015 prices)	Eurostat	Log-levels
Eurostoxx 600	ECB Statistical Data Warehouse	Log-levels
Term spread (10y vs. 2y)	ECB Statistical Data Warehouse	Levels (percentage points)
Shadow rate	Wu and Xia (2020)	Levels (percentage points)
Unemployment rate (by income class)	EU-SILC (cross-sectional data)	Levels (percentage points)
Labor income (by income class)	EU-SILC (cross-sectional data)	Log-levels
Job separation rate (by income class)	EU-SILC (longitudinal data)	Levels (percentage points)
Job finding rate (by income class)	EU-SILC (longitudinal data)	Levels (percentage points)

Annex 4. Cross-check validation: Bayesian SVAR model identified via zero restrictions

Table A4.1. Analysis I – Contemporaneous restrictions

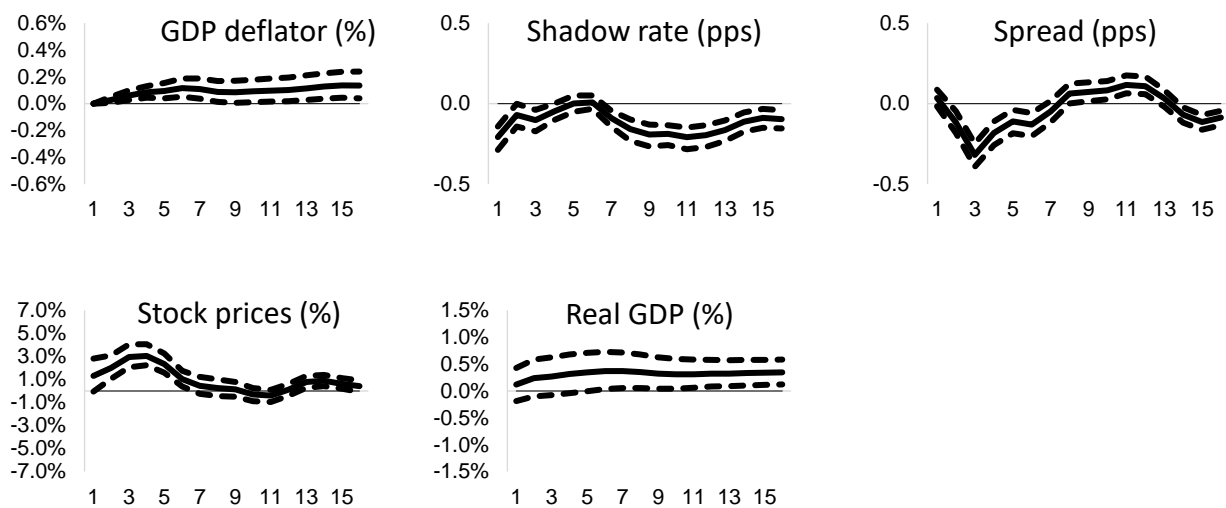
Shock:	GDP deflator	Shadow rate	Term spread	Stock prices	Real GDP	Unemp. rate	Labour income
Response:							
GDP deflator		0	0	0	0	0	0
Shadow rate			0	0	0	0	0
Term spread				0	0	0	0
Stock prices					0	0	0
Real GDP						0	0
Unemp. rate							0
Labour income							

Table A4.2. Analysis II – Contemporaneous restrictions

Shock:	GDP deflator	Shadow rate	Term spread	Stock prices	Real GDP	Unemp. rate	Labour income
Response:							
GDP deflator		0	0	0	0	0	0
Shadow rate			0	0	0	0	0
Term spread				0	0	0	0
Stock prices					0	0	0
Real GDP						0	0
Job separation rate							0
Job finding rate							0

Figure A4.1. Analysis I – Estimated IRFs to an expansionary monetary policy shock (1/3)

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)

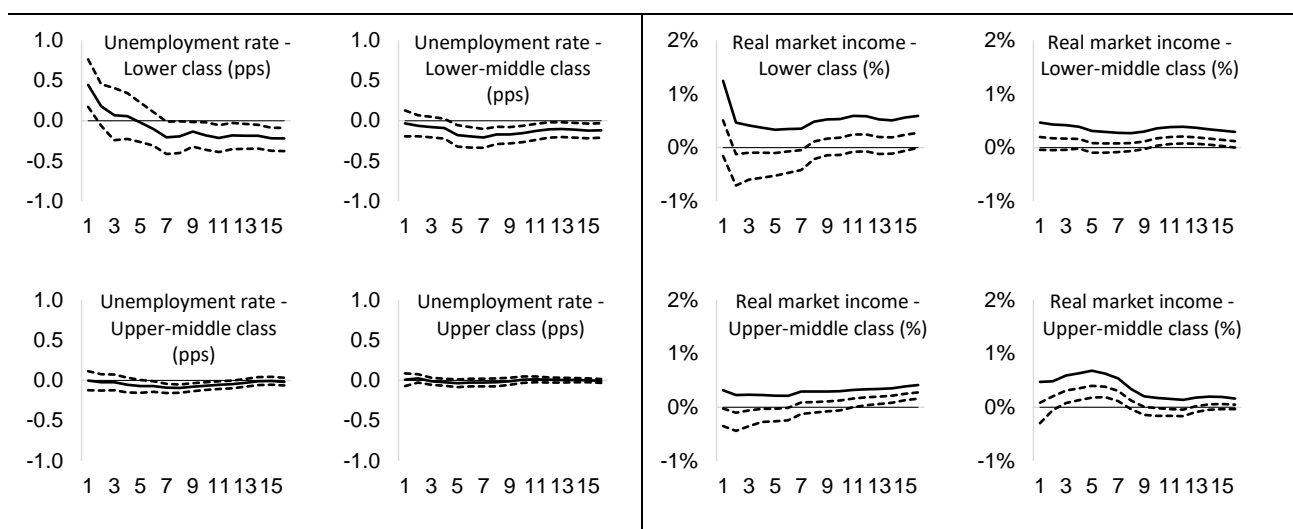


Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock.

Figure A4.2. Analysis I – Estimated IRFs to an expansionary monetary policy shock (2/3)

Figure A4.3. Analysis I - Estimated IRFs to an expansionary monetary policy shock (3/3)

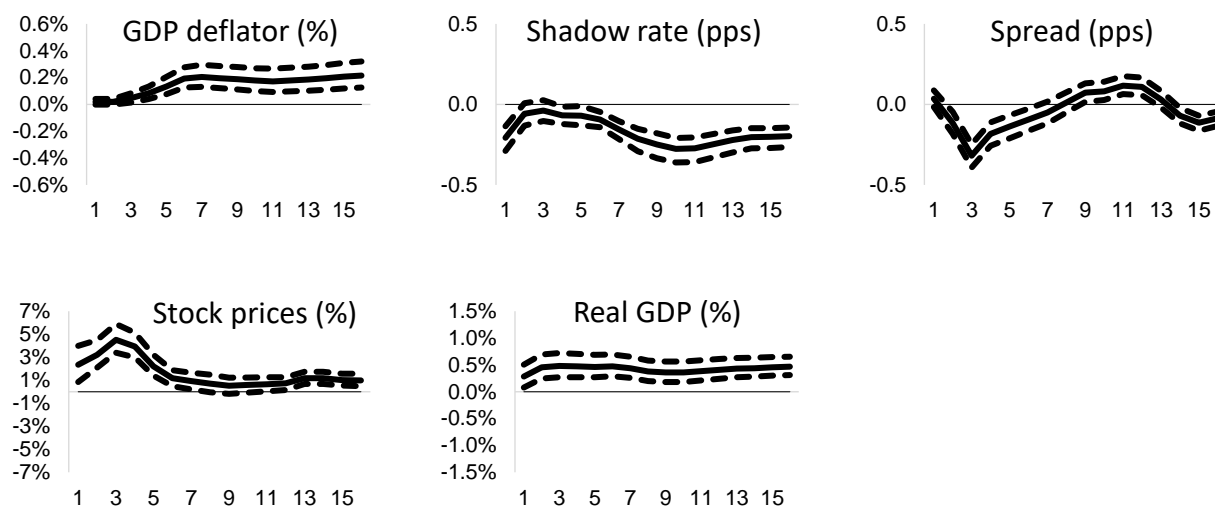
(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock. Charts present the results aggregated for all countries in the sample (namely, AT, BE, DE, ES, FI, FR, IE, IT, LU, NL, PT) using as weight the average real gross domestic product during the period between 2006 and 2019.

Figure A4.4. Analysis II – Estimated IRFs to an expansionary monetary policy shock (1/3)

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock.



Figure A4.5. Analysis II – Estimated IRFs to an expansionary monetary policy shock (2/3)**Figure A4.6. Analysis II - Estimated IRFs to an expansionary monetary policy shock (3/3)**

(Shock: -1 percentage point shock to an orthogonal deviation in the shadow rate)



Notes: Shaded areas and dotted lines refer to 90% confidence bands. X-axis refers to the number of quarters after the shock. Charts present the results aggregated for all countries in the sample (namely, AT, BE, ES, FI, FR, IE, IT, LU, NL, PT) using as weight the average real gross domestic product during the period between 2006 and 2019.

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Chapter 3

Effects of monetary policy shocks on income mobility in the euro area countries

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Summary: This paper examines the impacts of monetary policy shocks on income mobility in the Euro area, relying on earnings heterogeneity and income composition channels through which monetary policy affects income distribution. From a relative mobility perspective, upward and downward mobility are estimated over the period 2004-2014 for the EMU countries that originated the Economic and Monetary Union (EMU 1999). By using a vector error correction model (VECM) approach, overall we find that an expansionary monetary policy seems to encourage upward mobility and discourage downward mobility. By income groups, a loose monetary policy appears to reduce downward mobility for the upper class, while no empirical evidence can be provided to support that monetary policy shocks alter upward mobility for the lower class. Monetary policy shocks are especially favourable for the middle class as an expansionary monetary policy seems to boost upward mobility. A detailed analysis of the middle class shows that an expansionary monetary policy may propel the upward mobility and hinder the downward mobility of the lower-middle class, particularly favouring this income group.

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Part II.

On financial markets

Chapter 4

A deep dive into the capital channel of risk
sharing in the euro area



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Abstract

This paper investigates the contribution of capital markets to international risk sharing in the euro area over the 2000Q1-2021Q1 period. It provides three main contributions: First, the estimation of country-specific vector autoregressions (VAR) shows that shock absorption through capital markets remains modest, particularly in the southern euro area. Second, we analyse the geographical patterns of the capital channel. While risk sharing between southern and northern euro area countries led the improvements in income smoothing at the beginning of the 2000s, intra-regional capital flows supported income smoothing in the recent past. Third, based on a panel threshold VAR, we analyse how the composition of external capital positions impacts the capital channel. Long-term portfolio debt assets and liabilities as well as equity liabilities significantly improved income smoothing. The effect is more pronounced for northern countries, in line with their larger cross-border portfolios, when compared to the southern countries. Regarding foreign direct investment, only northern countries benefited from inward positions.

Keywords: international risk sharing, capital channel, external financial structure, CMU, panel threshold vector autoregression (TVAR) model.

JEL Classification: C23, E62, G11, G15.

Non-technical summary

The COVID-19 crisis represents a shock common to all euro area countries. Nonetheless, its economic consequences have been highly asymmetric across countries. In the face of idiosyncratic economic shocks, national public support measures are able to address country-specific impacts. However, international risk sharing through private capital markets could also play an important role in helping mitigate the economic downturn suffered by more severely affected countries and foster their recovery via capital inflows originating in less affected countries. Thus, the pandemic has renewed the need for better integrated capital markets to promote cross-border risk sharing within the euro area (EA) given its asymmetric economic consequences. However, evidence so far suggests a limited contribution of capital markets to risk sharing in the EA. Against this background, this paper presents a deep dive into risk sharing via capital markets, providing fresh evidence of its evolution and its drivers in the euro area. To study how intra-EA capital flows have helped countries smooth out their country-specific shocks to gross domestic product (GDP), we focus on ten longstanding EA countries. This smoothing effect through capital markets, also referred to as “income smoothing”, implies that variations in domestic production do not generate mirroring variations in domestic income or, ultimately, in consumption. Instead, income and consumption are at least partially shielded from country-specific GDP fluctuations via capital flows from and towards other EA countries.

Specifically, this paper provides three main contributions and results. First, we provide time-varying estimates of the capital channel for the period from 2000Q1 to 2021Q1, covering the first year of the COVID-19 pandemic, based on country specific vector autoregression (VAR) models. The results show that income smoothing remained modest, but also resilient when including the first quarters of the COVID-19 pandemic. Looking at the evolution between 2000Q1 and 2021Q1, our analysis suggests that income smoothing improved during the early 2000s and until around the sovereign debt crisis. However, this aggregate trend masks important geographical patterns.

Therefore, in a second step, we analyse the geographical patterns of the capital channel, by grouping countries according to their similarities in their external capital positions, resulting in a group of northern and a group of southern euro area countries. We observe that the positive evolution of the capital channel was largely driven by the contribution of capital holdings between southern and northern countries (i.e. inter-regional capital positions). After the global financial crisis and the subsequent sovereign debt crisis, income smoothing collapsed. This deterioration was significant for southern countries, which faced a tightening in international financial markets that prompted a decline in their cross-border intra-EA liabilities, particularly affecting inter-regional liabilities (i.e. liabilities where the investor is located in a northern country). This decline materially weakened risk sharing via capital markets in southern countries. In fact, over the last years, inter-regional capital flows exerted a dis-smoothing effect for these countries, thereby exacerbating rather than smoothing out the differences in the GDP growth rates among the two regions.

In a third contribution, we analyse how the composition of external capital positions impacts the capital channel based on a panel threshold VAR. To do this, we combine the national accounts data with information on intra-EA cross-border financial portfolios and direct investment positions from the Coordinated Portfolio Investment Survey and the Coordinated Direct Investment Survey. We find that the financial instruments significantly differ in their contribution to income smoothing. Long-term portfolio debt assets and liabilities as well as portfolio equity liabilities benefited risk sharing, the impact being significantly larger in northern countries - in line with the more sizeable cross-border portfolios in these countries. Regarding the role played by foreign direct investment (FDI), our results suggest that only northern countries were able to benefit from inward flows, which relates to the fact that the bulk of FDI in the euro area flew towards northern countries during the analysed period.

1 Introduction

This paper provides fresh evidence on the evolution of income smoothing and its drivers in the euro area using country-specific and panel threshold vector autoregression (TVAR) models. The COVID-19 crisis has renewed the need for better-integrated capital markets to promote cross-border risk sharing within the euro area. While the pandemic represents a shock common to all euro area countries, its economic consequences are highly asymmetric, depending on country-specific factors such as domestic mitigation strategies and the importance of economic sectors hit more or less severely (Guerrieri et al., 2022; Muggenthaler et al., 2021; Milesi-Ferretti, 2021). Besides public support measures via fiscal policy to address country-specific effects, private capital markets can be crucial to limit economic downturns and to foster the recovery. However, previous empirical evidence suggests that the contribution of cross-border capital markets to risk sharing remains largely unexploited in the European Monetary Union (EMU), particularly in comparison to a long-established monetary union like the United States (Asdrubali et al., 1996; Mélitz and Zumer, 1999; Furceri and Zdzienicka, 2015; Beck et al., 2016; Poncela et al., 2019; Milano, 2017; Cimadomo et al., 2018; Hoffmann et al., 2019).

While international risk sharing works through different channels, we focus on the role of capital market integration, and, hence, on the smoothing of domestic shocks through net factor income on external capital positions.¹ For example, if a country is hit by an idiosyncratic adverse shock, foreign liabilities imply that losses do not only accrue to the domestic economy but are also shared with foreign investors. At the same time, domestic income can, among others, be stabilised through interest, dividend, or profit receipts from foreign assets. Hence, internationally diversified asset and liability positions can mitigate the link between domestic business cycles and domestic income.

Efficient and integrated financial markets are a prerequisite for private risk sharing, and periods with more capital market integration are associated with more international risk sharing (Sørensen et al., 2007; Rangvid et al., 2016). Since the 1990s, financial globalization and the creation of the EMU have created cross-border investment opportunities and contributed to greater ownership diversification, allowing investors to spread their income risk across a larger number of countries (Kalemli-Ozcan et al., 2004; Kose et al., 2009; Balli et al., 2013). However, not all financial instruments are equally conducive to risk sharing. This is especially the case during financial stress periods, when financial markets are likely to suffer from abrupt tightening and instruments that are state-contingent or for which the conditions have been negotiated before the negative shock materialised are particularly desirable. Theory suggests that the capital channel has special features that could make it particularly resilient and, hence, well-suited for handling large-scale and long-lasting crises featuring uncertain recovery prospects. Thus, it is highly relevant to revisit the evolution and drivers of the capital channel of risk sharing in the euro area at this point in time.

Against this background, and following policy efforts to promote capital market integration via the European Capital Markets Union (CMU), this paper contributes three novelties to the literature. First, we provide time-varying estimates of the capital channel using quarterly national accounts data for a set of ten long-standing EMU countries over the 2000Q1 to 2021Q1 period. Given previous findings of heterogeneous developments between countries related to risk sharing in the literature (Nardo et al., 2017; Asdrubali et al., 2018; Poncela et al., 2019), we base our analysis on country-specific vector autoregression (VAR) models.²

¹The bulk of risk sharing through the capital channel takes place via factor income from abroad; that is, rents, interest, and profits (including retained earnings) derived from properties or investment held abroad. Albeit to a lesser extent, risk sharing through the capital channel also takes place through the compensation of workers who receive labour income from abroad. Workers who stay for a year or longer abroad are considered residents and the associated capital flows are categorised as remittances which are instead attributed to the international transfers channel.

²So far, the literature analysed the evolution of risk sharing with two different techniques. Some authors use

To better understand the drivers of income smoothing, in a second step we examine the contributions to risk sharing depending on geographical patterns of capital market integration. We group countries according to similarities in their external capital positions, resulting in a group of northern (or: “core”) and a group of southern (or: “periphery”) euro area countries. We then estimate the share of a country-specific shock to domestic production that is smoothed via intra-regional cross-border capital positions, i.e. both the debtor and creditor are in the same region, as well as through inter-regional holdings, where financial assets connect core and periphery debtors and creditors. This allows us to disentangle the contributions to income smoothing that result from capital market integration within and between the two regions.

Third, we analyse the role of the composition of cross-border financial holdings for income smoothing. It is important to provide fresh results for this question as previous studies suggest that income smoothing capacities differ between cross-border equity and debt holding (Hoffmann et al., 2019; Kose et al., 2009), but provide mixed results on which financial instruments are associated with more risk sharing. In addition, the question on whether these effects differ between balance sheet sides is not clearly answered, suggesting that conclusions are largely contingent on the specific samples studied. Furthermore, the bulk of the literature focuses on the period before and during the Global Financial Crisis (GFC). More specifically, Sørensen et al. (2007), analysing EU and OECD countries between 1993 and 2003, conclude that larger holdings of foreign assets are associated with better risk sharing. Demyanyk et al. (2008) find similar results when looking at both EMU and EU samples over the 1995-2006 period. According to Balli et al. (2013), who focus on industrial countries between 1999 and 2009, income smoothing in the euro area was achieved mainly through interest receipts originating from debt asset securities during the GFC, and, to a lesser extent, through dividend payments on equity liabilities. Balli et al. (2014) obtain similar results for a subset of EU countries.

To identify the importance of different financial instruments for past increases or decreases in risk sharing via the capital channel, we estimate a threshold panel VAR model. To the best of our knowledge, we are the first to investigate the role of capital market integration within a multi-equation dynamic framework. Previous analyses use interaction terms in static models employing univariate regressions (Sørensen et al., 2007; Artis and Hoffmann, 2008; Balli et al., 2013; Hoffmann et al., 2019). We take a granular look at the composition of countries’ external capital holdings: Besides differentiating between debt and equity components of portfolio positions and foreign direct investment (FDI), we also consider the effects of cross-border investments (i.e., assets) and cross-border funding (i.e., liabilities) on income smoothing separately.

Our empirical analysis yields the following main results. First, we confirm for the post-GFC period that income smoothing remained modest in the euro area, with capital market integration smoothing no more than 8-10% of the idiosyncratic shocks to GDP, on average. This is in stark contrast to the US, where inter-state factor income smooths out around 50% of the idiosyncratic shocks to GDP (Alcidi et al., 2017). Despite some variation in the contribution of the capital channel over the sample period, income smoothing remained resilient when including the first quarters of the COVID-19 pandemic. Yet, our country-specific results uncover significant cross-country heterogeneity. These suggest that the core countries were better able to smooth income via external capital positions than peripheral countries, where the capital channel collapsed during the second half of the sample period. This seems to be explained by the significantly smaller intra-euro area portfolio and foreign direct investment holdings in the periphery when compared to the core countries.

static models via seemingly unrelated regressions (SUR) and include interaction terms with time-varying variables that capture the financial structure (Nardo et al., 2017; Hoffmann et al., 2019; Cimadomo et al., 2020) Others use VAR models and perform sequential estimates over limited sub-samples following a rolling window approach (Cimadomo et al., 2018). Unlike the former, the VAR approach accounts for dynamics and feedbacks among the different channels. In our analysis, we make use of country-specific VAR models to implicitly account for country heterogeneity, in line with Asdrubali et al. (2018).

Second, the collapse of income smoothing witnessed by peripheral countries after the GFC and the subsequent sovereign debt crisis relates to the decline in cross-border liabilities, particularly those for which the investor is located in a core country. In fact, our results suggest inter-regional capital flows have exerted a dis-smoothing effect for peripheral countries over the last years, implying they have travelled from worse off (periphery) to better off (core) countries, thereby exacerbating (rather than smoothing out) the differences in the growth rate among the two regions. In addition, inter- and intra-regional capital positions contributed differently to the evolution of income smoothing. In the aftermath of the GFC, improvements in risk sharing via the capital channel were mainly driven by better inter-regional risk sharing. In contrast, since around the sovereign debt crisis, income smoothing relied on intra-regional mechanisms, pointing to the need to improve financial integration between euro area regions. An exploratory analysis of the data reveals increases in cross-border holdings within the two country groups over the sample period, while integration across the two country groups via debt instruments rather declined over this time span.

Third, turning to the importance of the composition of external capital holdings, we show that the contribution to income smoothing varied not only by financial instrument, but also by its position in the balance sheet (i.e., portfolio assets and liabilities, inward and outward FDI positions). Zooming in on portfolio holdings, our dynamic model suggests that interest receipts and payments associated with long-term portfolio debt assets and liabilities benefited risk sharing in both regions. However, the identified impact is significantly larger for core countries, which coincides with their more sizeable cross-border portfolios when compared to periphery countries. Equity liabilities also greatly contributed to risk sharing, particularly in core countries, despite their lower magnitude when compared to debt. Looking at the role played by foreign direct investment (FDI), we find that inflows only had a large and significant effect on income smoothing in core countries. This result mirrors the magnitude of FDI (in % of GDP), which is much larger for northern compared to southern countries. The bulk of the FDI in the euro area flows towards northern countries.

The remainder of the paper is structured as follows. In Section 2, we provide background information on the theory of international risk sharing and its channels. Section 3 describes the data and stylized facts on the composition of cross-border financial holdings. Section 4 lays out our empirical approach, while Section 5 presents the results. Section 6 offers concluding remarks and policy implications.

2 Theoretical background: international risk sharing

2.1 The concept of international risk sharing

The concept of international risk sharing refers to the idea that countries can insure themselves against purely domestic shocks. Unexpected changes in national income can be smoothed through net income flows, both public and private, from unaffected countries. As a result, domestic consumption and income fluctuations are milder than output fluctuations, thus decoupling domestic welfare from variations in domestic output. At the margin, perfect risk sharing implies that domestic output fluctuations are not passed on to consumption, which instead depends solely on global output. In such a situation, agents are insured against every diversifiable risk and consumption growth rates are equalized across countries (Mace, 1991). This means that international risk sharing works as an insurance mechanism that helps attenuate the adverse consequences of country-specific downturns. Likewise, excessive positive deviations in economic growth can also be smoothed via income outflows toward foreign economies. This stabilizing effect softens the need for fiscal and monetary interventions, which is of particular importance in the EMU, where the single monetary policy is unable to react to asymmetric shocks. In this vein, as highlighted in the Five Presidents' Report (European Commission, 2015), international risk-sharing

within the EMU is needed to complement national tools employed by euro area countries to counter the impact of domestic shocks.

Private risk sharing operates through two main channels.³ First, the credit channel refers to the ability of (cross-border) net borrowing providing access to credit in times of downturns to insulate consumption. This is usually referred to as “consumption smoothing”.⁴ Second, the capital channel contemplates that geographically diversified investment portfolios generate factor income flows that are unrelated to the domestic economy. In this sense, the possibility to receive labour income, interest, dividend or profit payments from foreign investments can help sustain income during country-specific economic downturns, thus providing “income smoothing”. During booms, the opposite mechanisms, e.g. income outflows in the form of interest payments, also help to smooth income and, ultimately, consumption.

2.2 Empirical foundations of estimating international risk sharing

In order to analyse the contribution of the capital channel and, subsequently, of cross-border financial instruments to international risk sharing, we follow the framework developed in the seminal paper by Asdrubali et al. (1996). This empirical set-up is based on the decomposition of the cross-sectional variance of country-specific (idiosyncratic) output growth. To derive this decomposition, we first rewrite country output growth as follows:

$$\widehat{\Delta gdp}_t^i = [\widehat{\Delta gdp}_t^i - \widehat{\Delta gni}_t^i] + [\widehat{\Delta gni}_t^i - \widehat{\Delta nni}_t^i] + [\widehat{\Delta nni}_t^i - \widehat{\Delta nndi}_t^i] + [\widehat{\Delta nndi}_t^i - \widehat{\Delta c}_t^i] + \widehat{\Delta c}_t^i \quad (1)$$

where the variables refer to the logarithms of real per capita gross domestic product (*GDP*) of country *i* at time *t*, gross national income (*GNI*), net national income (*NNI*), net national disposable income (*NNDI*), and consumption (*C*). Given that common shocks cannot be insured, the variables are expressed in terms of the country-specific component of the variables, i.e. their deviation with respect to the weighted aggregate at the EA10 level. As highlighted by Asdrubali et al. (2018), the idea behind this econometric approach is that if two successive income measures (i.e. those between brackets in equation (1) do not co-move perfectly, shocks are smoothed through the risk-sharing channel represented by their difference. For example, a positive correlation coefficient between \widehat{gdp}_t^i and \widehat{gni}_t^i below one implies that cross-border income flows provided a certain degree of income smoothing. Instead, a negative correlation would point towards a dis-smoothing effect, meaning that this channel increases fluctuations of income compared to GDP fluctuations.

In a second step, we rearrange equation (1) after taking the covariance with $\widehat{\Delta gdp}_t^i$ and divide it by the variance of $\widehat{\Delta gdp}_t^i$ to arrive at equation (2), which represents the decomposition of the cross-sectional variance of country-specific output growth in terms of the coefficients that can be interpreted as the contributions of the different risk-sharing channels.

$$\beta_I^i + \beta_D^i + \beta_F^i + \beta_C^i = 1 - \beta_U^i \quad (2)$$

³Public and private mechanisms for risk sharing cannot be mapped one-to-one to the different channels described above. Regarding public risk sharing, it can be achieved through direct fiscal transfers at a supra-national level. However, the institutional architecture of the EMU and, more specifically, the lack of central fiscal power embedded in its design, limits the potential of this stabilisation mechanism. Still, since the 2010s, public risk sharing in the EMU has benefitted from several financial assistance facilities, i.e. the European Financial Stability Facility (EFSF), the European Financial Stability Mechanism (EFSM), and the European Stability Mechanism (ESM) (Milano and Reichlin, 2017; Cimadomo et al., 2018, 2020). Likewise, the “Next Generation EU” and its Recovery Resilience Fund activated during the COVID-19 crisis seem to have positively contributed to risk sharing (Cimadomo et al., 2022). Public risk sharing could also complement private risk sharing, given that a central fiscal capacity could, for example, reduce financial frictions associated with cross-border private financial markets, making private external borrowing more convenient (Giovannini et al., 2022).

⁴It includes private but also public elements if risk sharing is facilitated through the use of public resources.

$$\beta_I = \frac{\text{cov}(\widehat{\Delta gdp}_t^i - \widehat{\Delta gni}_t^i, \widehat{\Delta gdp}_t^i)}{\text{var}(\widehat{\Delta gdp}_t^i)} \quad (3)$$

$$\beta_D = \frac{\text{cov}(\widehat{\Delta gni}_t^i - \widehat{\Delta nni}_t^i, \widehat{\Delta gdp}_t^i)}{\text{var}(\widehat{\Delta gdp}_t^i)} \quad (4)$$

$$\beta_F = \frac{\text{cov}(\widehat{\Delta nni}_t^i - \widehat{\Delta nndi}_t^i, \widehat{\Delta gdp}_t^i)}{\text{var}(\widehat{\Delta gdp}_t^i)} \quad (5)$$

$$\beta_C = \frac{\text{cov}(\widehat{\Delta nndi}_t^i - \widehat{\Delta c}_t^i, \widehat{\Delta gdp}_t^i)}{\text{var}(\widehat{\Delta gdp}_t^i)} \quad (6)$$

$$\beta_U = \frac{\text{cov}(\widehat{\Delta c}_t^i, \widehat{\Delta gdp}_t^i)}{\text{var}(\widehat{\Delta gdp}_t^i)} \quad (7)$$

Specifically, these channels represent the capital channel for income smoothing (β_I^i), the depreciation channel (β_D^i), the international transfers channel (β_F^i) and the credit or savings channel for consumption smoothing (β_C^i). β_U^i refers to the share of the shock that remains unsmoothed, which would be zero for the case that there is perfect international risk sharing, meaning that the GDP and consumption of a country are uncorrelated. In such a case of full risk sharing, real consumption growth would not respond to idiosyncratic shocks to domestic output but would depend only on global output. For each country, total risk sharing through the four channels is represented by $1 - \beta_U^i$.

In our analysis, we focus on the smoothing through the capital channel (β_I^i), which indicates the extent to which cross-border net factor income flows, i.e. investment income receipts from cross-border financial assets and payments on cross-border financial liabilities, help to shield income from country-specific output fluctuations.

2.3 Focusing on the capital channel

Analysing the evolution and determinants of the capital channel in the euro area is highly relevant given that it has certain elements that could make it particularly resilient and, hence, well-suited for handling large-scale and long-lasting crises featuring uncertain recovery prospects.⁵ In particular, there are certain features that might make the capital channel more resilient than the credit channel, namely its *ex-ante nature*, *inter-spatiality* and *state-contingency*. However, not all financial instruments present these three features to the same degree and, thus, the composition of countries' external portfolios is crucial for building resilient and effective private risk sharing mechanisms (Hoffmann et al., 2019; Kose et al., 2009).

First, the *ex-ante* nature relates to the moment when the conditions of the related financial flows are negotiated. For equity instruments, these are usually agreed upon before the shock materialises, thus endowing the capital channel with an *ex-ante* smoothing capacity (Becker and Hoffmann, 2006) that tends to be less vulnerable to the recovery expectations in terms of magnitude and persistence of the downturn.⁶ Long-term financial debt negotiated before the shock, which does not need to be rolled over during the crisis, would also have this feature. In contrast, the credit or savings channel is considered to be an *ex-post* channel, as borrowing is triggered by the credit demand of affected countries.

⁵Among others, Hoffmann et al. (2019) document that, while the consumption smoothing provided by the credit channel was significantly impaired during the GFC, the capital channel for income smoothing remained rather resilient and only deteriorated during the sovereign debt crisis and its aftermath.

⁶In fact, the low degree of international risk sharing tends to be associated with a lack of *ex-ante* mechanisms (Asdrubali et al., 1996; Sørensen and Yosha, 1998).

Second, *inter-spatiality* relates to the cross-sectional dimension of financial flows. Equity instruments provide an inter-spatial shock absorption capacity, as dividends flow from less affected to more affected economies, without entailing future re-payment commitments. Instead, debt instruments offer an inter-temporal smoothing effect, which could be hampered, at least partially, in the long run, when the repayment duties have to be faced. The intertemporal nature also applies to the credit channel. Giannone and Reichlin (2006) show that consumption can be hedged via borrowing and lending only for a restricted period of time. According to Alcidi et al. (2017), even though shocks tended to be more persistent in the euro area when compared to the US, international risk sharing in the euro area strongly relied on the credit channel, which is less stable in response to persistent shocks. Therefore, developing the capital channel is of particular importance. In contrast to borrowing and lending, the inter-spatial effect provided by equity avoids any future reversals of the short-term positive smoothing effect. Consequently, these instruments tend to generate more resilient and longer-lasting income smoothing effects (Beck et al., 2016).

Third, payments that are contingent on the financial situation of the borrower and could be interrupted during downturns are particularly desirable from a risk sharing perspective. Equity securities are beneficial in this respect, as they entail *state-contingent* payoffs. While equity holders receive a compensation depending on the financial situation of the borrower, they also share the downside risks (e.g., dividend outflows might be suspended during recessions), without the need to enter insolvency proceedings. With debt instruments, investors only incur losses if there is a default.

Further, equity contracts are concluded without an end date and do not entail rollover risks.⁷ Unlike equity, debt finance in general - in particular, short-term debt - tends to be comparatively more pro-cyclical, as the associated payments tend to be independent of economic fluctuations. Normally, principal repayments and interest duties need to be paid unconditionally, which may become harder during a crisis. Therefore, their main contingency (the default risk) tends to increase during bad times, leading to abrupt tightening of borrowing conditions for newly issued debt, which increases the likelihood and severity of financial crises (Montiel and Reinhart, 1999). This could make the potentially positive effects of financial market integration disappear during downturns if cross-border portfolios are mainly composed of pro-cyclical debt finance (Albertazzi and Bottero, 2014).

For these reasons, existing studies highlight that international cross-border holdings of equity may be better able to provide resilient capital flows and guarantee a higher degree of long-term risk sharing than debt securities (Artis and Hoffmann, 2011). Thus, the weak income smoothing capacity in the euro area could be related to the magnitude and composition of its cross-border financial holdings, specifically the lack of cross-border equity. This is why we analyse the importance of the geographical patterns and different financial instruments for income smoothing in the following sections.

⁷Rollover risk is a risk associated with the refinancing of debt. When a loan or other debt obligation needs to be converted and if interest rates have risen in the meantime or the borrower has become riskier, the debt needs to be refinanced at a higher rate. There is also the risk that the debt may not be refinanced at all, potentially leaving the borrower with a financing gap. Rollover risk is commonly faced by countries and companies when a loan or other debt obligation (like a bond) is about to mature and needs to be converted, or rolled over, into new debt.

3 Data

3.1 Macroeconomic variables

Our analysis of international risk sharing and, more specifically, income smoothing within the euro area uses quarterly National Accounts data from Eurostat for the period 2000Q1-2021Q1. Data extracted from National Accounts includes gross domestic product (*GDP*), gross national income (*GNI*), net national income (*NNI*), net national disposable income (*NNDI*), and total consumption (*C*). We limit our sample to ten long-standing euro area-member countries (EA10),⁸ namely Austria, Belgium, Germany, Greece, Finland, France, Italy, the Netherlands, Spain, and Portugal. By limiting our sample to countries that were members of the euro area during the entire time horizon considered in our estimation, we abstract from the potential effects of currency risk and the implications of new countries joining the monetary union. Hence, while our analyses focuses on risk sharing among the ten euro area countries, technically income smoothing can also be provided by cross-border positions vis-à-vis the rest of the world, including through currency risks and opportunities. In this vein, Giovannini et al. (2020) highlight the sensitivity of risk sharing estimates to the country sample, among other factors. In particular, risk sharing is not an “absolute” estimate but rather a “relative” concept, always interpreted against a certain subset of reference countries. This implies the results in this literature need to be carefully interpreted as measuring risk sharing among the countries included in the specific sample.

The variables enter the model as quarterly real per capita country-specific deviations, expressed in log-differences. To construct these variables, we deflate nominal values with their national harmonised consumer price index (HCPI)⁹ and divide them by their respective population numbers, before transforming them into log-differences. Country-specific idiosyncratic deviations are computed using the difference between each variable and its cross-country weighted average for the ten countries included in our sample. We follow the procedure described in Beyer et al. (2001), whereby the aggregate values are constructed performing the aggregation directly in growth rates and using time-varying weights representing the share of each country in aggregate real GDP instead of per capita terms, whereby small countries with very high income per capita would be given too high weights.

National Accounts data are disaggregated into specific sub-components identifying the different channels of international risk sharing:

- *Capital channel*: $GDP - GNI$ (net factor income from abroad).
- *Depreciation channel*: $GNI - NNI$, mainly imputed values.
- *International transfers channel*: $NNI - NNDI$ (using net international transfers). This channel includes supra-national fiscal efforts such as EU structural funds and private remittances.
- *Credit or savings channel*: $NNDI - C$ (using net private and public savings). This includes national government lending/borrowing, including borrowing from euro area financial assistance facilities like the EFSF, the EFSM, and the ESM.

⁸Luxembourg and Ireland are excluded as financial centres due to their particular structures of financial holdings. In addition, Ireland, which had large revisions in its GDP, has also been excluded in related analyses (Giovannini et al., 2020).

⁹The choice of the deflation method is based on Sørensen and Yosha (2007), who illustrate that CPI deflated GDP (i.e., the “consumption value” of output) is the appropriate method for deflating nominal GDP for the purpose of studying risk sharing, rather than using a GDP deflator (i.e., the “volume” of output).

3.2 Capital market variables

In order to assess the importance of capital market integration, we analyse the role of the composition of external financial holdings, relying on cross-border portfolio holdings data from the Coordinated Portfolio Investment Survey (CPIS) and cross-border direct investment positions from the Coordinated Direct Investment Survey (CDIS), both published by the International Monetary Fund. CDIS data comprises cross-border investment decisions that are not covered in CPIS and through which a resident in a specific economy seeks to gain control or exert a significant degree of influence on the management of the acquired foreign enterprise. The threshold for the ownership of equity or debt to be considered FDI is defined as the investor being entitled to 10% or more of the voting power.

In line with Balli et al. (2013), we look at portfolio data for assets and liabilities separately to distinguish which of the two sides (receipts arising from foreign holdings or payments due to cross-border liabilities) was more important for risk sharing. Similarly, we split our analysis for FDI into inward and outward intra-EA10 FDI positions. Direct investment data provided by the IMF refers to equity and debt stocks in countries' foreign portfolios, with data on "inward" direct investment positions referring to direct investment into the reporting economy, and "outward" positions relating to direct investment abroad by the reporting country. The CPIS data is available on an annual basis from 2001 until 2012 and bi-annually from mid-2013 to 2020 for many (but not all) countries, while CDIS data is available from 2009 until 2020 on a yearly basis.¹⁰

Given the differences in the frequency and time availability between the datasets, we estimate different models to look at the effects of portfolio and direct investment separately. We use the ratio of intra-EA10 cross-border holdings over GDP as a measure of capital market integration within the euro area by aggregating the bilateral holdings for the ten countries included in the sample. As risk sharing is analysed relative to the other countries in the sample, it is only natural to look at financial integration in the form of cross-border positions vis-à-vis the same country sample.¹¹ External portfolio positions are broken down into debt (short-term¹² and long-term¹³) and portfolio equity¹⁴ holdings. Similarly, we consider equity and debt FDI.

3.3 Stylised facts on the composition of cross-border financial holdings

Overall, intra-EA10 cross-border portfolio holdings increased strongly at the beginning of our sample period. Subsequently, their volume has been more stable (Figure 1, upper left panel). When interpreting the data in the charts, it should be borne in mind that CPIS data might provide a biased view on both total and bilateral portfolio linkages across the countries in our sample due to the financial activity taking place in Luxembourg, Ireland and the Netherlands, which Beck et al. (2023) refer to as "onshore offshore financial centers" (OOFCS)

¹⁰We use annual figures for 2013 for all countries in the sample and bi-annual data as of 2014.

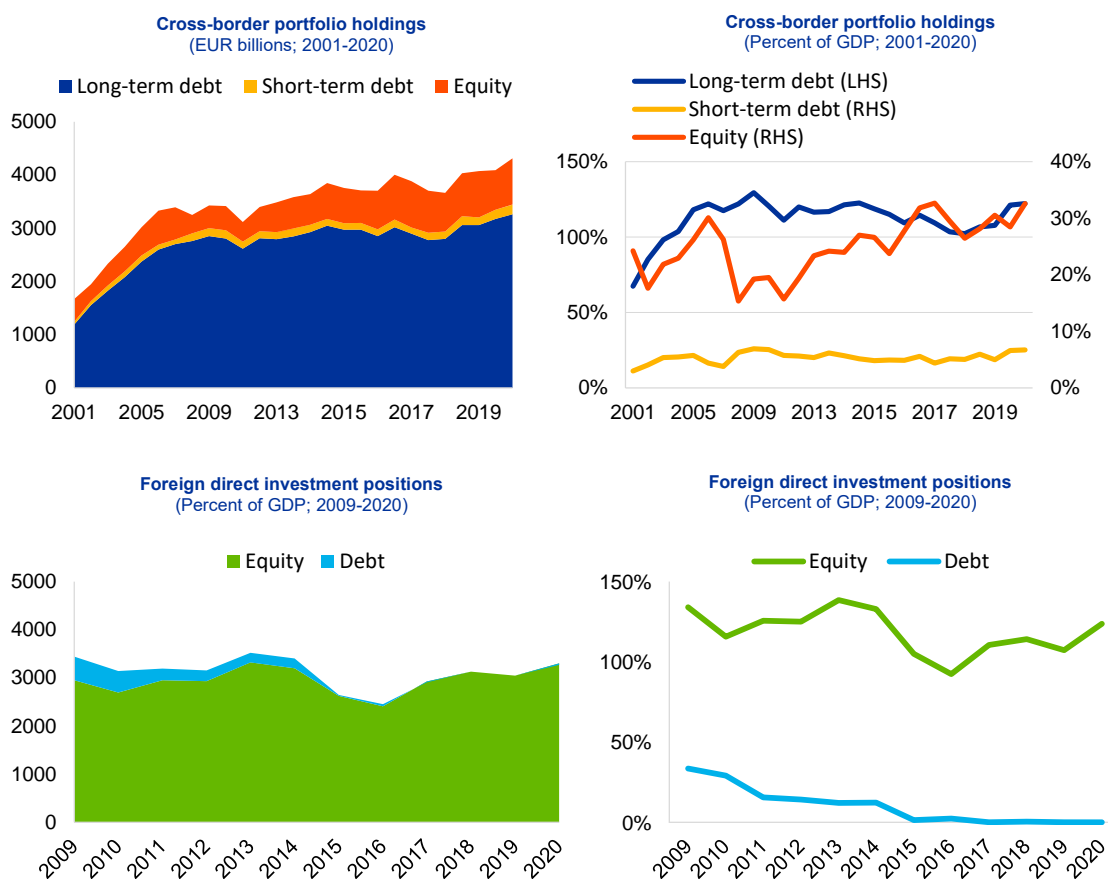
¹¹Cimadomo et al. (2020) also calculate their financial integration measures among the country pairs within their country sample.

¹²Short-term debt securities cover treasury bills, negotiable certificates of deposits, commercial paper, and bankers' acceptances that generally give the holder the unconditional right to a stated fixed sum of money on a specific date. These instruments are usually traded on organized markets at a discount and have an original maturity of one year or less.

¹³Long-term debt securities cover instruments such as commercial and government bonds, debentures and notes that usually give the holder the unconditional right to a fixed money income or contractually determined variable money income and have an original maturity of more than one year.

¹⁴Equity securities comprise all instruments and records that acknowledge claims on the residual value of corporations or quasi corporations, after the claims of all creditors have been met. Shares, stocks, participations, or similar documents usually denote ownership of equity.

Figure 1: Evolution of cross-border portfolio and direct investment positions within EA10



Sources: IMF, Coordinated Portfolio Investment Survey, Coordinated Direct Investment Survey.

Note: The upper figures plot total intra-EA10 cross-border positions held by EA10 countries, both in absolute magnitudes in EUR billions (left panel) and as a percentage of total nominal GDP (right panel). Therefore, it could be regarded as either total intra-EA10 assets or liabilities. The CPIS data is available annually from end-2001 to end-2012, and bi-annually starting from the end of June 2013. The lower figures plot total intra-EA direct investment positions reported by EA10 countries, both in absolute magnitudes in EUR billions (left panel) and as a percentage of total nominal GDP (right panel). Therefore, they could be regarded as either total intra-EA10 direct investment inward or outward positions. The CDIS data is available annually from end-2009 to end-2020.



within the euro area as most European investment funds reside there. Specifically, Beck et al. (2023) document the statistical implications of the dual roles of OOFs, as hubs of financial intermediation and as places of securities issuance.¹⁵

Long-term debt instruments dominate intra-EA10 cross-border portfolios with a share of almost 76%, while equity only represents 20%, and short-term debt is negligible at around 4%. Relative to GDP, long-term debt amounted to roughly 100% during our sample period, while equity was significantly lower, with 25% on average (Figure 1, upper right panel). Portfolio equity and long-term debt displayed differing dynamics during our sample period. Equity holdings halved during the early stage of the GFC and subsequently followed an upward trend. Long-term debt still expanded at the beginning of the GFC but dropped significantly around the time of the sovereign debt crisis and continued to decrease (relative to GDP) before slowly moving upwards again as of 2018 (Figure 1, upper right panel).

Looking at foreign direct investment positions, we observe the bulk of it takes the form of equity securities (Figure 1, lower left panel). In particular, equity FDI followed an upward trend during the 2010-2013 period, before sharply declining over 2014-2016. Since then, it resumed an increasing trend and rose to around 123% relative to GDP in 2020 (Figure 1, lower right panel).

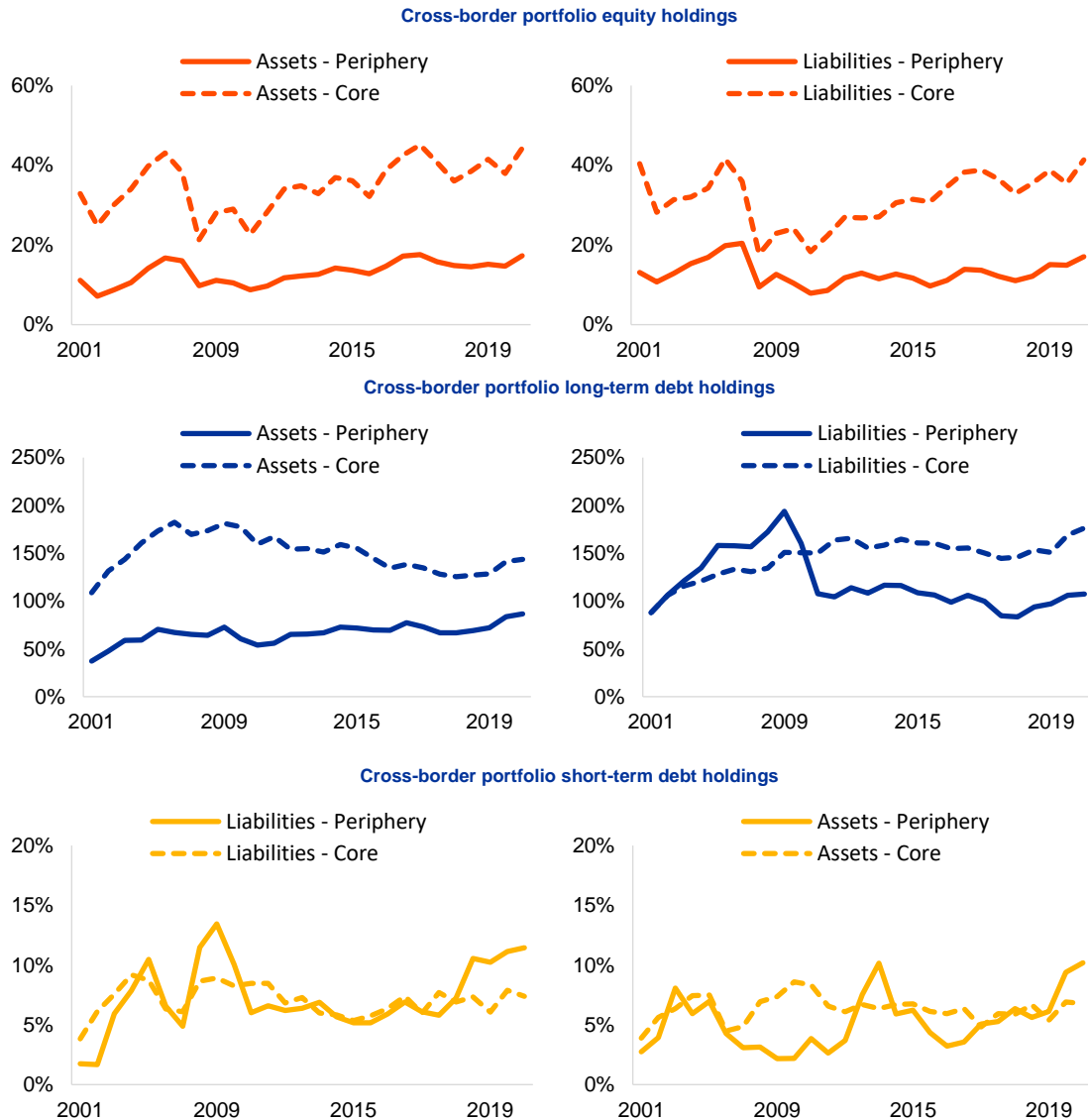
Moving from the euro area aggregates to the country-level, we find heterogeneous patterns both in terms of overall size and evolution of external capital positions. Total cross-border portfolio (long-term and short-term debt plus equity) and direct investment positions (both in % of GDP) are lower for a group of countries including Italy (IT), Spain (ES), Greece (GR) and Portugal (PT) compared to a group of countries including Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), and the Netherlands (NL) over our sample period. Therefore, we divide our country sample into a northern region including AT, BE, DE, FI, FR, NL (or: “core”), while the southern region includes ES, GR, IT, PT (or: “periphery”).

Splitting the external capital positions not only by instrument and balance sheet side, but also by country group, reveals that the evolution was quite heterogeneous across the two regions. Zooming into portfolio holdings (Figure 2, Table 1), both portfolio equity assets and liabilities (in % of GDP) were, on average, a bit less than three times greater in northern countries. While cross-border equity assets increased since the GFC in both regions, surpassing their pre-crisis levels by mid-2017, the gap between the two groups widened. Cross-border equity liabilities show a similar pattern. Southern and northern countries still heavily rely on long-term debt, particularly on the funding side. The importance of debt is particularly striking for the southern countries in the years before the GFC until around 2009. Short-term debt positions were small and volatile, particularly in the southern countries.¹⁶

¹⁵As an example of this bias, “indirect” or “intermediated” bilateral linkages, such as German shares held by Luxembourg-based investment funds owned by Spanish residents, would not be included in our analysis as Luxembourg is excluded from our data sample. Similarly, German shares held by investment funds based in the Netherlands are interpreted as bilateral flows between this country and Germany regardless of the residence of the ultimate owner of the investment fund shares. Our analysis does not take into account indirect bilateral linkages due to lack of comparable data across countries noting the previous literature that has pointed to difficulties in obtaining the data as well as to the wide set of assumptions that would need to be taken in order to provide such detailed estimates (Felettigh and Monti, 2008; Della Corte et al., 2018).

¹⁶Short-term debt generated sudden and massive reversals in capital flows (Montiel and Reinhart, 1999). However, causality runs in both directions and the lack of equity holdings and excessive fluctuations in short-term debt holdings might not only cause but also reflect financial instability. In this sense, Diamond and Rajan (2001) remark that unstable funding structures might be associated with low creditworthiness and debt repayment capacity of the borrower.

Figure 2: Intra-EA10 cross-border portfolio holdings by country group and instrument, in percent of GDP



Sources: IMF, Coordinated Portfolio Investment Survey, 2001 - 2020.

Note: "Periphery" refers to euro area countries with lower total cross-border portfolio and direct investment positions (ES, GR, IT, PT), while "core" encompasses the remaining countries (AT, BE, DE, FI, FR, NL). The chart displays simple averages for the ratios across the countries composing every group. The CPIS data is available annually from end-2001 to end-2012, and bi-annually starting at end-June 2013.

Table 1: Intra-EA10 cross-border portfolio holdings by country group and instrument (in % of GDP)

	Periphery			Core		
	Min	Mean(Median)	Max	Min	Mean(Median)	Max
<u>Assets</u>						
Equity	0.064	0.123 (0.135)	0.165	0.196	0.337 (0.345)	0.422
Short-term debt	0.020	0.051 (0.049)	0.102	0.037	0.061 (0.063)	0.084
Long-term debt	0.349	0.640 (0.668)	0.887	1.038	1.445 (1.465)	1.769
<u>Liabilities</u>						
Equity	0.081	0.124 (0.122)	0.195	0.163	0.306 (0.309)	0.393
Short-term debt	0.015	0.071 (0.063)	0.126	0.037	0.068 (0.068)	0.088
Long-term debt	0.811	1.143 (1.081)	1.833	0.838	1.410 (1.479)	1.772

Sources: IMF, Coordinated Portfolio Investment Survey.

Note: “Periphery” refers to euro area countries with lower total cross-border portfolio and direct investment positions (ES, GR, IT, PT), while “core” encompasses the remaining countries (AT, BE, DE, FI, FR, NL). Table includes simple averages for each group for the period 2001-2020.

Focusing on FDI (Figure 3, Table 2), cross-border equity holdings are the bulk of intra-EA positions (see also Figure 1). Both inward and outward equity FDI is around twice as high in core countries compared to periphery countries, revealing these economies do not just receive a larger amount of investment from abroad, but also tend to hold greater positions when investing in other EA10 economies. The evolution of inward and outward equity FDI was similar across regions (upper panels in Figure 3). Interestingly, while outward equity holdings improved for both regions, in particular in 2020, inward FDI increased mostly in core countries. FDI taking the form of debt was less than one fifth of equity FDI. It steadily declined since 2009 and represented a very small part of intra-EA10 direct investment by 2020.

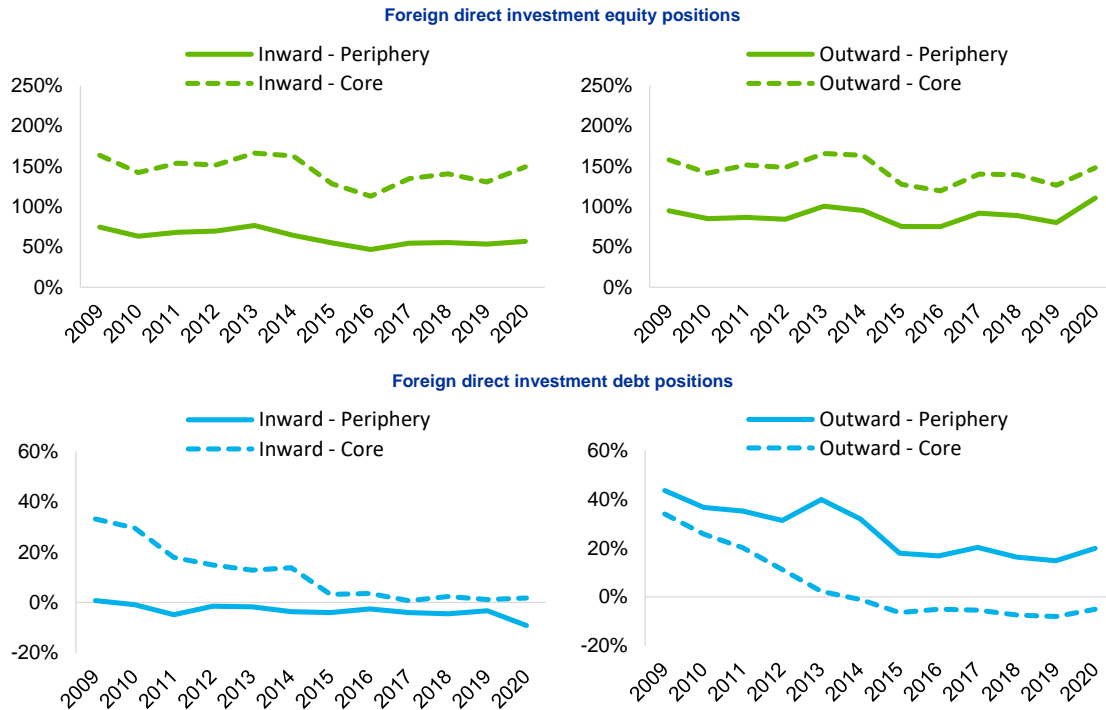
4 Empirical methodology

4.1 Country-specific VAR - Disentangling intra- and inter-regional risk sharing

In order to address endogeneity between the different GDP components and to factor in the complex dynamics and feedback arising between the different risk sharing channels and GDP, we rely on a multi-equation approach to estimate all coefficients jointly in a VAR framework (Asdrubali and Kim, 2004; Asdrubali et al., 2018).¹⁷ Unlike

¹⁷The empirical analysis is performed using the Bayesian estimation, analysis, and regression (BEAR 4.2) toolbox developed by Dieppe et al. (2016) at the European Central Bank. We accept the End User Licence

Figure 3: Intra-EA10 foreign direct investment holdings by country group and instrument, in percent of GDP



Sources: IMF, Coordinated Direct Investment Survey, 2001 - 2020.

Note: "Periphery" refers to euro area countries with lower total cross-border portfolio and direct investment positions (ES, GR, IT, PT), while "core" encompasses the remaining countries (AT, BE, DE, FI, FR, NL). The chart displays simple averages for the ratios across the countries composing every group. The CDIS data is available annually from end-2009 to end-2020. Direct investment positions are negative when a direct investor's claims on its direct investment enterprise are below the direct investment enterprise's claims on its direct investor. Direct investment equity positions can also be negative due to negative retained earnings, which might result from the accumulation of negative reinvested earnings.

static approaches based on SUR models, VAR models capture dynamic dependencies between variables and trace how every risk-sharing channel reacts over time in the presence of an exogenous structural shock to GDP. More specifically, in a VAR framework, all variables in the system, including output, are endogenously determined by both contemporaneous and lagged values of all the variables comprising the model. Previous studies using dynamic frameworks to quantify international risk sharing employ pooled models, where the parameters are assumed to be equal across countries and derived using group mean estimators (Asdrubali and Kim, 2004; Becker and Hoffmann, 2006). The financial fragmentation that prevailed during the GFC casted doubts on the plausibility of the homogeneous coefficients' assumption, as EMU countries benefited to differing degrees from income smoothing. Consequently, more recent studies suggest estimating separate models for each country (Kalemli-Ozcan et al., 2014; Nardo et al., 2017; Asdrubali et al., 2018; Poncela et al., 2019). In the following, we start by estimating

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Table 2: Intra-EA10 cross-border direct investment holdings by country group and instrument (in % of GDP)

	Periphery			Core		
	Min	Mean(Median)	Max	Min	Mean(Median)	Max
<u>Inward</u>						
Equity	0.469	0.617 (0.603)	0.767	1.129	1.449 (1.456)	1.665
Debt	-0.92	-0.033 (-0.035)	0.008	0.007	0.112 (0.082)	0.033
<u>Outward</u>						
Equity	0.753	0.891 (0.878)	1.108	1.196	1.444 (1.450)	1.659
Debt	0.148	0.271 (0.258)	0.436	-0.08	0.046 (-0.031)	0.340

Sources: IMF data (Coordinated Direct Investment Survey).

Note: “Periphery” refers to euro area countries with lower total cross-border portfolio and direct investment positions (ES, GR, IT, PT), while “core” encompasses the remaining countries (AT, BE, DE, FI, FR, NL). Table includes simple averages for each group for the period 2009-2020. Direct investment positions are negative when a direct investor’s claims on its direct investment enterprise are below the direct investment enterprise’s claims on its direct investor. Direct investment equity positions can also be negative due to negative retained earnings, which might result from the accumulation of negative reinvested earnings.

country-specific models and then extend this framework to understand how income smoothing evolved between different regions, namely core and periphery countries, in the euro area.

VAR analyses obtain country-specific estimates of risk sharing for each channel by considering the conditional moments of the vector $Y_t^i = [\widehat{\Delta gdp}_t^i, \widehat{\Delta gdp}_t^i - \widehat{\Delta gni}_t^i, \widehat{\Delta gni}_t^i - \widehat{\Delta nni}_t^i, \widehat{\Delta nni}_t^i - \widehat{\Delta nndi}_t^i, \widehat{\Delta nndi}_t^i - \widehat{\Delta c}_t^i]'$. In our analysis, we expand this empirical framework to not only look at country-specific estimates, but also to explicitly model two paths through which the capital channel might provide its income smoothing effect, namely intra- and inter-regionally. The overall capital channel in the vector above is represented by the second term, $\widehat{\Delta gdp}_t^i - \widehat{\Delta gni}_t^i$, where magnitudes are expressed as country-specific deviations with respect to the weighted aggregate values for the entire sample. To understand regional components, we divide the deviations into two sub-components to differentiate between (i) the idiosyncratic deviation of a given country with respect to its own region (i.e., intra-regional component), and (ii) the deviation with respect to those countries in the other region (i.e., inter-regional component):

$$\widehat{\Delta gdp}_t^i \approx \Delta gdp^i - \overline{\Delta gdp}^{EA10} \approx [\Delta gdp^i - \overline{\Delta gdp}^{core}]w_1 + [\Delta gdp^i - \overline{\Delta gdp}^{perip}]w_2 \quad (8)$$

$$\widehat{\Delta gni}_t^i \approx \Delta gni^i - \overline{\Delta gni}^{EA10} \approx [\Delta gni^i - \overline{\Delta gni}^{core}]w_1 + [\Delta gni^i - \overline{\Delta gni}^{perip}]w_2 \quad (9)$$

$$Capitalchannel(intra) = [\Delta gdp^i - \overline{\Delta gdp}^{intra}]w_{intra} - [\Delta gni^i - \overline{\Delta gni}^{intra}]w_{intra} \quad (10)$$

$$Capitalchannel(inter) = [\Delta gdp^i - \overline{\Delta gdp}^{inter}]w_{inter} - [\Delta gni^i - \overline{\Delta gni}^{inter}]w_{inter} \quad (11)$$

where w_1 and w_2 are the weights of core and periphery in terms of GDP, respectively.¹⁸

¹⁸An illustration of the two sub-components (intra- and inter-regional deviation) for the case of the capital channel is provided in Figure A.3 in the Appendix for the case of Italy. It appears that the deviation of Italian net capital flows growth from the northern EA-countries average is larger than its deviation with respect to the

The dynamic interactions among the set of endogenous variables in Y_t^i is governed by the following system of autoregressive simultaneous equations in reduced form:

$$Y_t^i = \sum_{j=1}^p A_j^i Y_{t-j}^i + B^i + \epsilon_t^i \quad (12)$$

The superscript i refers to the countries included in our sample and corresponds to the ten long-lasting EMU-members, while t refers to nine-year periods covering the time horizon from 2000Q1-2008Q4 to 2012Q2-2021Q1 following a rolling-window approach.¹⁹ B denotes a vector of country-specific intercepts and A_j are matrices of coefficients on the j lags of the variables. The error term, ϵ_t^i , is an uncorrelated multivariate white noise with a diagonal variance-covariance matrix, Σ . We set the autoregressive order, p , equal to 4, as determined by the likelihood ratio test.

We want to trace the dynamic response of the different risk sharing channels - especially that of the capital channel - after an orthogonal shock to GDP. For this purpose, and in order to recover the parameters in the structural form equation from those estimated in the reduced form, we use a recursive identification scheme. Following Asdrubali and Kim (2004), Becker and Hoffmann (2006), and Asdrubali et al. (2018), we impose a zero recursive structure on the contemporaneous structural parameters. The reduced-form equation is then expressed in structural form as

$$G_0^i Y_t^i = \sum_{j=1}^p G_j^i Y_{t-j}^i + D^i + u_t^i, \text{ where } A_j^i = G_0^{i-1} G_j^i, B^i = G_0^{i-1} D^i \text{ and } \epsilon_t^i = G_0^{i-1} u_t^i \quad (13)$$

This identification scheme leverages the statistical properties of National Accounts data, with more exogenous variables ordered first in Y_t^i . This way it exploits the natural short run recursiveness in the data. It implies, for example, that $\widehat{\Delta gni_t^i}$ follows $\widehat{\Delta gdp_t^i}$ inasmuch as output must be first generated in order to generate factor income in the form of dividends, rents, and interest. Likewise, $\widehat{\Delta nni_t^i}$ follows $\widehat{\Delta gni_t^i}$ inasmuch as taxes presuppose a taxable income has been previously generated. In other words, the variables are contemporaneously affected only by those ordered before (above) them.²⁰ Note that all variables are country-specific deviations from the log-difference of the EA10 aggregates, which can be separated into inter- and intra-regional deviations.

4.2 Interacted panel VAR - The role of cross-border capital holdings

In a second specification, we analyse the contribution of the composition of external financial holdings for international risk sharing via the capital channel. To gauge the effects of different instruments on risk sharing in the EMU, for portfolio holdings, we distinguish between equity, short-term and long-term debt on both the asset and liability side. In the same vein, for FDI, we distinguish between equity and debt for both outward and inward positions.

We extend the baseline methodology to account for non-linearities and estimate a panel threshold vector autoregression (TVAR) model for each of the ten different threshold variables, namely, the country-specific holdings of short-term debt, long-term debt, the portfolio equity assets and liabilities (as a share of GDP), as well as the country-specific direct investment holdings of both outward and inward debt and equity. This nonlinear analysis consists of conditioning the coefficient measuring risk sharing via the capital channel on a threshold variable so

group of southern EA-countries.

¹⁹We choose nine-year periods in order to provide results covering the aftermath of the global financial crisis and the sovereign debt crisis while, at the same time, maintaining the largest amount of information (i.e., using the longest time window possible) needed to identify structural shocks.

²⁰This recursive structure is suitable to identify an exogenous shock to gross domestic product. However, this approach/ordering would face limitations if the aim were to identify a different type of shock (e.g., a tax shock that affects taxable income).

as to provide a view on the within-country variation in income smoothing that is induced by the variation of cross-border portfolios. For each measure, we define two regimes, namely “high” and “low” holdings, and assume that the risk-sharing parameters of our model can differ between these different states. The state-contingent estimates seek to capture the importance of de facto financial integration in each capital market segment. More specifically, we extend the structural equation to:

$$Y_t^i = \sum_{j=1}^p A_j^{i1} Y_{t-j}^i + B^{i1} + \left(\sum_{j=1}^p A_j^{i2} Y_{t-j}^i + B^{i2} \right) I(s_t^i \geq m^i) + \epsilon_t^i \quad (14)$$

where A^1 and B^1 are, respectively, the slopes and intercepts prevailing under state 1, where a given financial integration measure, s_t , is below a certain threshold level, m . I is an indicator function that takes the value of 1 if the specific measure of cross-border financial holdings is higher than the threshold value m (state 2), and 0 otherwise (state 1). The indicator function that acts as an interaction term has the capacity to influence both the level and the dynamic relationship between endogenous variables through the vector of constants B^2 and the matrix of contemporaneous coefficients A^2 . The interaction term allows us to derive impulse response functions for different states of the financial structure distribution and to examine how cross-border financial portfolios affect the capital channel. In our case, the threshold value that governs different risk-sharing regimes is, *a priori* not known. Therefore, in order to distinguish the periods with “high” and “low” financial integration, for each country and financial integration measure, we specify a univariate regression, allowing for the covariance between the idiosyncratic deviation of GDP and that of the capital channel to differ among the two states:

$$\widehat{\Delta gdp}_t - \widehat{\Delta gni}_t = c + \beta_I^1(\widehat{\Delta gdp}_t) + \left(\beta_I^2(\widehat{\Delta gdp}_t) \right) I[s_t \geq m] + \epsilon_t \quad (15)$$

Following Li and St-Amant (2010), we apply Hansen’s methodology, which both tests for the existence of a threshold effect and detects the level of the threshold variable creating the inflection point. In practice, this model is estimated for all possible threshold values, m , and the sum of squared residuals is compared through a likelihood ratio test to identify the threshold level that provides the best fit. In other words, for each financial instrument, the final threshold we employ in our analysis is the one that maximizes the difference (in terms of income smoothing) between the two regimes. This approach allows the data to endogenously reveal the threshold level, instead of imposing it arbitrarily. The null hypothesis of no differential impact between regimes is tested using the Wald statistic.²¹ Nonlinearity tests confirm that the use of a non-linear framework with regime switches determined by external capital positions is warranted by the data. In order to avoid that one regime has a too-low number of observations, we exclude the threshold’s values for which the less populated regime contains less than 10% of the observations.

5 Results

5.1 Income smoothing in the euro area

Aggregate evolution

Figure 4 presents the estimation results from a country-specific VAR for all channels of risk sharing.²² It confirms

²¹See Tables A.1 and A.2 in the Appendix

²²To derive useful results for policy recommendations from these estimates we have to take into account the dynamic behavior. For this reason, we present the cumulative response, as the dynamic patterns differ across channels. For example, for the capital channel, the bulk of the effect takes place contemporaneously, while the credit channel displays a longer-lasting profile that presents a certain degree of dis-smoothing effect in the medium to long run

previous findings that a significant part of shocks to GDP remains unsmoothed in the euro area. In line with the previous literature, our results suggest that while the credit channel was historically the most important mechanism for cross-border risk sharing in the euro area, it significantly collapsed during the GFC. Since then, it resumed a solid upward trend, partially supported by the activation of supranational public loans to some euro area economies, such as the European Financial Stability Facility (EFSF) and the European Stability Mechanism (ESM) (Milano, 2017; Cimadomo et al., 2018, 2020). International transfers still play a very limited role (around 3%).²³ In line with the literature (e.g. (Sørensen and Yosha, 1998)), the coefficient for the imputed depreciation channel is negative, indicating a dis-smoothing effect.²⁴

Turning to our main object of interest in this paper - the capital channel -, the results reveal that the degree of income smoothing was historically rather modest in the euro area, hovering below 10% (Figures 4 and 5), in line with existing literature (Furceri and Zdzienicka, 2015; Nardo et al., 2017; Asdrubali et al., 2018; Hoffmann et al., 2019; Poncela et al., 2019). Still, risk sharing through the capital channel underwent a period of sustained improvement, increasing from about 4% at the beginning of our sample to a peak slightly above 8% for the period spanning 2004Q4 - 2013Q3. However, the impact of the GFC and the subsequent sovereign debt crises significantly eroded the income smoothing capacity in the euro area, which temporarily returned to levels below those seen at the beginning of our sample. Our estimates as of 2010 suggest a positive recovery trend, although it remains at low levels of around 5%. Overall, at the end of the sample period, around 60% of the shock remained unsmoothed, meaning this part of the deviation in gross domestic product passed through to domestic consumption. This figure is larger than the magnitude at the beginning of the 2000s, when it stood at around 40%, highlighting that the sum of the smoothing effects provided by the different channels has not recovered to past levels.

Geographical patterns of the capital channel

However, income smoothing was quite heterogeneous across countries and the intra- and inter-regional contributions evolved differently. For our sample of EA10 countries, the improvement in income smoothing in the aftermath of the GFC was driven by increasing contributions of inter-regional risk sharing (Figure 5). Subsequently, its contribution collapsed and remained at around zero or even negative values as of the 2010s. The intra-regional contribution to income smoothing was more resilient and entirely drove the increase in income smoothing for the estimation windows starting mid-2011.

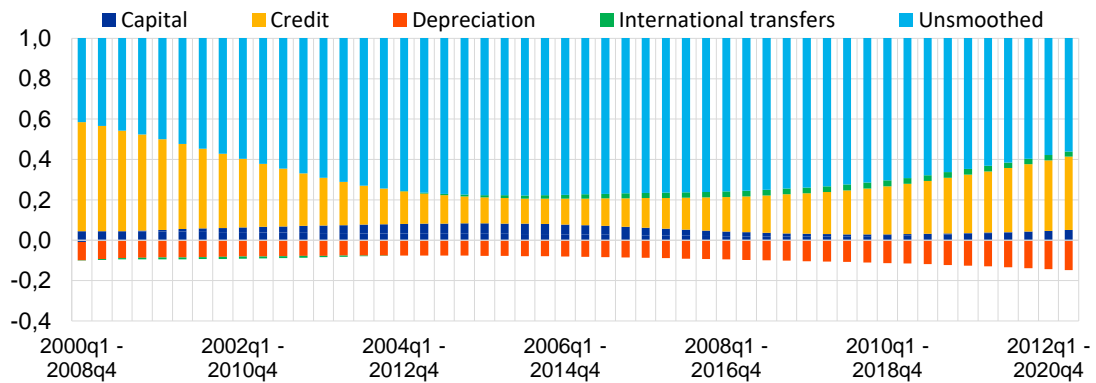
Turning to the disaggregated results for the southern and northern euro area countries shows that income smoothing was significantly lower in southern (Figure 6, left panel) than northern countries (Figure 6, right panel).²⁵ While income smoothing in the southern countries improved to almost the same level as for the northern countries until around the sovereign debt crisis, it subsequently fell to zero. This breakdown of the capital channel in the southern countries is mainly explained by the inter-regional contributions to income smoothing, which increased quite strongly and were higher compared to the intra-regional income smoothing in the period up to the GFC. However, since the GFC, the inter-regional capital channel steadily declined, even becoming negative during the last years. At the same time, the intra-regional contributions started to increase but only partially compensating the inter-regional contributions to income smoothing. Thus, income smoothing fell to zero at the end of our sample period. For northern countries, the intra-regional contributions to risk sharing via the capital channel

²³The contribution of the international transfers channel to overall risk sharing is largely explained by the design of fiscal policy at the EMU level. While pro-cyclical supra-national fiscal policy seems to have provided a slight dis-smoothing effect during the first years of the sample, fiscal transfers undertaken at the European level (e.g., transfers through EU structural funds) together with international remittances, seem to have increased the positive contribution to risk sharing since the GFC.

²⁴This is not surprising, as in the National Accounts data, depreciation constitutes a larger fraction of output during recessions and a smaller fraction during booms, which consequently means that the capital-output ratio is typically countercyclical.

²⁵Our results are robust to estimates using the aggregated values for the capital channel. Results are available upon request.

Figure 4: International risk sharing in the EA10, share of total idiosyncratic shock



Sources: Own calculations based on Eurostat quarterly national accounts data.

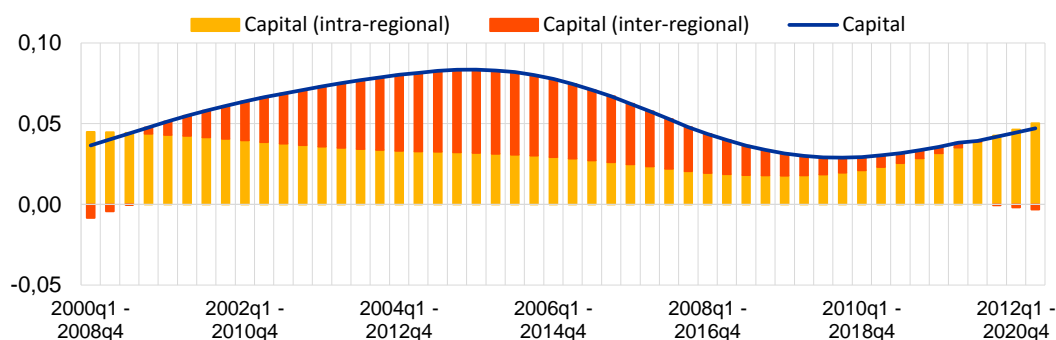
Note: The bars indicate the share of the total idiosyncratic shocks that is smoothed out via each of the channels for risk sharing in the EA10. The shares are computed on the basis of the cumulative impact of the shock on the variables capturing each channel for the two years after the shock. This allows us to account for the potential reversal dynamics that are associated with, for example, debt repayment duties. The contributions of the channels are computed using a country-specific vector-autoregression (VAR). Parameters are estimated over a nine-years rolling window of quarterly data. We compute the results for each country and average over the cross-section using real GDP as weights. The estimates are smoothed using the trend component of the Hodrick-Prescott filter with smoothing parameter equal to 250.

were comparatively larger than in southern countries, while the collapse of the inter-regional risk sharing was less pronounced than for southern countries. Thus, leading to an overall greater income smoothing effect in northern countries, in particular at the end of our sample period.

Looking at the composition of the intra-EA10 cross-border capital portfolios helps to explain these results. At the beginning of our sample, we observe an important increase in long-term portfolio debt assets held by northern countries used to finance the periphery. This dynamic is also observed when looking at inter-regional long-term debt assets and liabilities held by peripheral countries, which increased during the years before the GFC. These developments back the improvement in the inter-regional component of the capital channel enjoyed by southern countries. However, between 2009 and 2011, the size of the inter-regional portfolio debt exposures strongly decreased for southern countries and remained depressed over the following years. After the sovereign debt crisis, inter-regional equity assets held by southern countries not only recovered but also initiated a marked increase, doubling their magnitude (in % of GDP) by 2017. Oppositely, portfolio equity liabilities and long-term debt instruments (on both sides of the balance sheet), remain below pre-crisis levels until the end of the sample period. The increase in inter-regional equity assets held by southern countries suggests a strengthening of capital flowing “uphill” from southern to northern countries. According to Garnier (2014), this led to core countries profiting from *ex-ante* insurance in bad times while southern countries experienced balance of payment crises. The underlying dynamic of equity flows from more distressed countries to less distressed ones (instead of the opposite direction) helps explain not only the overall collapse in inter-regional risk sharing that has taken place since the sovereign debt crisis (Figure 5), but also its negative contribution (i.e. “dis-smoothing” effect) to risk sharing in southern countries (Figure 6).

Regarding southern countries’ intra-regional portfolios, they have been on a sharp increasing trend since 2012,

Figure 5: Risk sharing via the capital channel in the EA10, share of total idiosyncratic shock



Sources: Own calculations based on Eurostat quarterly national accounts data.

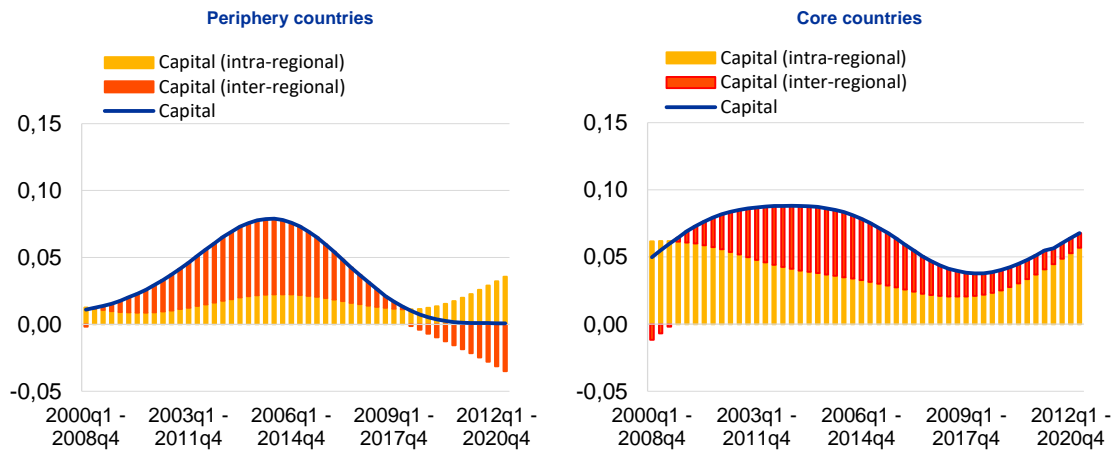
Note: The blue line indicates the share of the total idiosyncratic shocks that is smoothed out via the capital channel in the EA10 overall, whereas the bars show the part that is smoothed intra-regionally (i.e. within each of the two regions, yellow bar) and inter-regionally (i.e. between the two regions, orange bars). The shares are computed on the basis of the cumulative impact of the shock on the variables capturing the capital channel for the two years after the shock. The contributions of the capital channel are computed using a country-specific vector-autoregression (VAR). Parameters are estimated over a nine-year rolling window of quarterly data. Therefore, results for e.g. 2008q4 are obtained using a sample covering 2000q1-2008q4. We compute the results for each country and average over the cross-section using real gross domestic product as weights. The estimates are smoothed using the trend component of the Hodrick-Prescott filter with smoothing parameter equal to 250.

mostly fuelled by long-term debt. This seems to have positively contributed to the intra-regional component of the capital channel for southern countries. Looking at direct investment, we observe that inward FDI in southern countries has declined since 2009, when it represented around 40% of GDP (considering both intra- and inter-regional exposures) while it amounted to around 30% of GDP in 2020 (Figure 8, lower left panel). Similarly, the bulk of peripheral countries' equity outward direct investment flew towards northern countries, with this magnitude further increasing in 2019 and 2020 (Figure 8, upper left panel).

Turning to the northern countries, we observe that the bulk of their cross-border portfolios comprises intra-regional holdings (Figure 7), which helps to explain why income smoothing offered by the intra-regional component of the capital channel is particularly relevant. The strong decline of the inter-regional component for risk sharing during the second half of the sample period goes in parallel with an important reduction of inter-regional long-term debt assets, which declined sharply (relative to GDP) between 2009 and 2011 and continued to decrease (albeit on a slower pace) ever since. Compared to pre-GFC inter-regional portfolios, the only item that increased for core countries is equity liabilities, but even at their peak, these represent a lower portion of their cross-border portfolio holdings (less than 10% of GDP), suggesting the crisis left long-lasting scars in the integration of capital markets between northern and southern countries.

Focusing on FDI, Figure 8 shows that intra-regional linkages are above inter-regional exposures in northern countries. Like portfolio holdings, inter-regional inward investment towards core countries is much larger than outward investment from these countries toward the southern region. In fact, both inter- and intra-regional FDI outflows seem to have core countries as their destination (Figure 8, lower panels).

Figure 6: Income smoothing in the EA10 by country group, share of total idiosyncratic shock



Sources: Own calculations based on Eurostat quarterly national accounts data.

Note: “Southern” refers to euro area countries that experienced a significant deterioration in their credit rating since the onset of the global financial crisis (ES, GR, IT, PT), while “northern” encompasses the remaining countries (AT, BE, DE, FI, FR, NL). We compute the results for each country and average for each region over the cross-section using real gross domestic product as weights. The estimates are smoothed using the trend component of the Hodrick-Prescott filter with smoothing parameter equal to 250.

To summarize, the capital channel in both regions seems to be largely driven by long-term portfolio debt holdings and foreign direct equity investment. The variation in long-term debt positions tends to mirror the changes in income smoothing capacity. Due to their small magnitude, short-term debt portfolios and debt FDI do not play a significant role in cross-border exposures.²⁶

5.2 The role of external portfolio composition for income smoothing

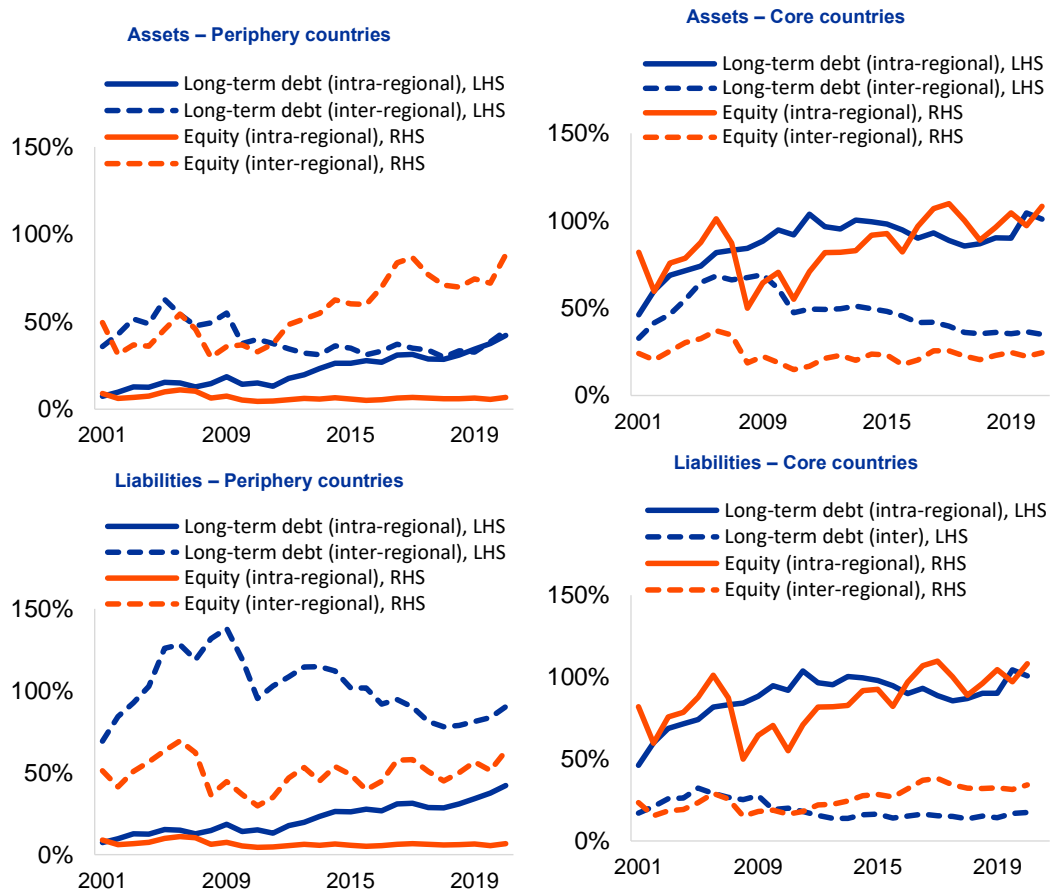
Next, we empirically test the hypothesis that the contribution to income smoothing in core and periphery countries differs across financial instruments, both for portfolio holdings (short-term debt, long-term debt, equity) and direct investment (equity).²⁷ For each instrument, we test whether there are differences for risk sharing between investment abroad (which generates capital receipts/inflows) and funding from abroad (which generates capital payments/outflows). Due to the differences in the frequency and the time dimension of the datasets employed for retrieving cross-border portfolio (CPIS) and foreign direct investment (CDIS) holdings,²⁸ we estimate separate models. Furthermore, the results obtained in this section are not directly comparable to the estimates included

²⁶See Figures A.1 and A.2 in the Appendix.

²⁷The overall holdings of inward and outward direct debt investment are very low (see Figure 3). The estimated effects are insignificant and not included in Figure 11. The results are available upon request.

²⁸The CPIS data is available on an annual basis from 2001 until 2012 and bi-annually from mid-2013 to 2020, while CDIS data is available from 2009 until 2020 on a yearly basis.

Figure 7: Intra-EA10 cross-border portfolio holdings by regions, in percent of GDP



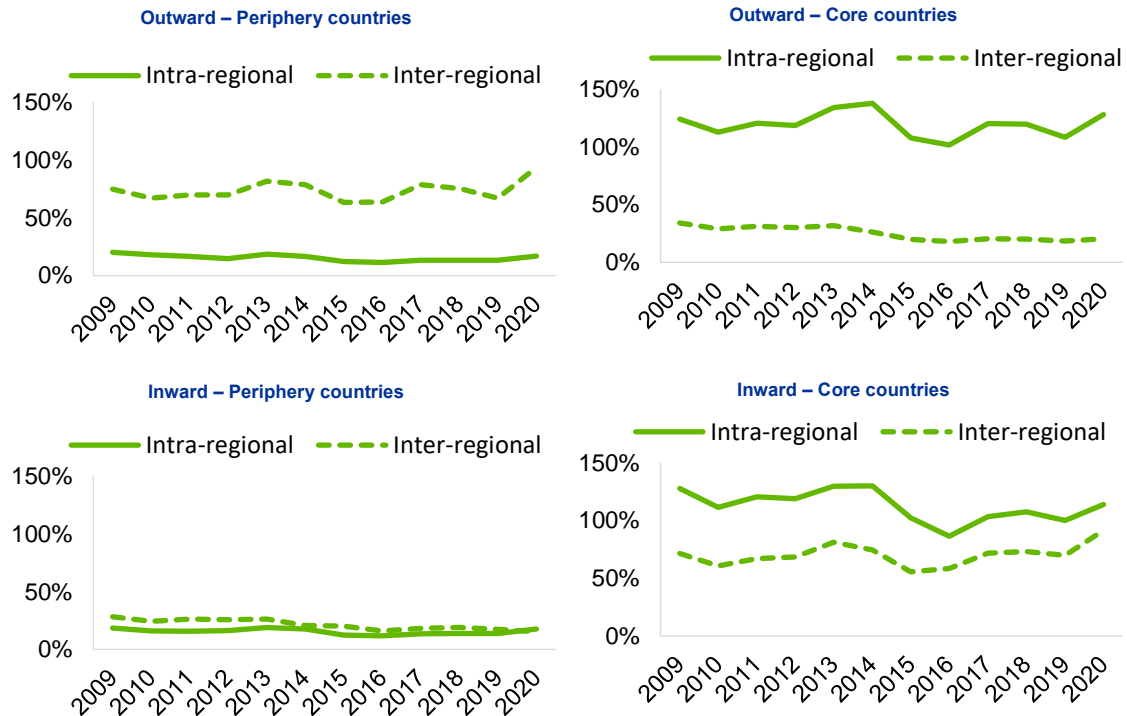
Sources: IMF, Coordinated Portfolio Investment Survey, 2001 - 2020. Note: The CPIS data is available annually from end-2001 to end-2012, and bi-annually starting at end-June 2013. Ratios are computed as a percentage of the region of reference's GDP.

in the previous section (Section 5.1) given that the empirical approaches employed differ.²⁹ In particular, results included here should be interpreted as the additional income smoothing effect derived during periods when the holdings of a certain cross-border financial instrument are particularly high.

Our results suggest that the income smoothing effect significantly differs across portfolio and direct investment, assets and liabilities, and euro area regions. Figure 9 plots cumulative impulse response functions (IRFs) based

²⁹In section 5.1 we estimate country-specific VAR models with quarterly frequency using data for 2000q1-2021q1 and applying a nine-years rolling window approach. Instead, in section 5.2 we estimate panel models to disentangle the differential magnitude associated to the periods where the cross-border holdings of a specific instruments are particularly high. Frequency and time dimension of the models vary so as to accommodate the features of CPIS and CDIS datasets.

Figure 8: Intra-EA10 foreign direct investment holdings by regions, in percent of GDP



Sources: IMF, Coordinated Direct Investment Survey, 2009 - 2020. The CDIS data is available annually from end-2009 to end-2020. Ratios are computed as a percentage of the region of reference's GDP.

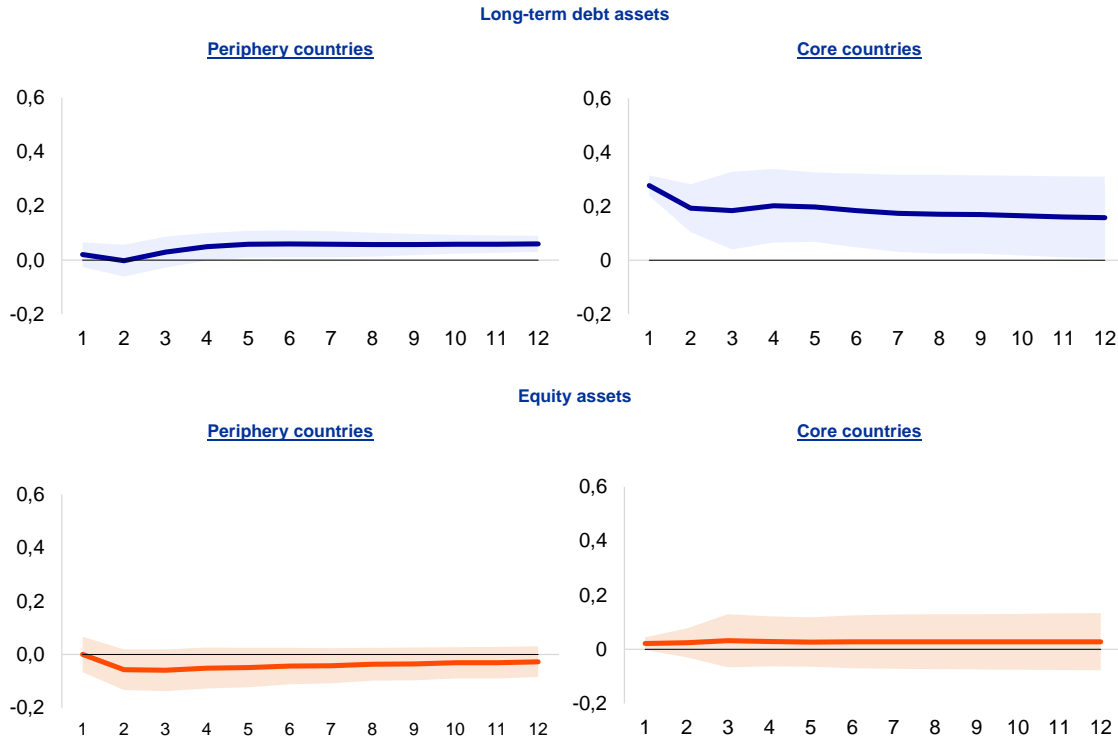
on equation (14) for additional income smoothing in state 2 (times of “high” capital holdings) relative to state 1 (times of “low” capital holdings). The cumulative IFRs are displayed so as to account for the potential (usually partial) dis-smoothing effect associated with instruments that entail a contemporaneous capital inflow that need to be repaid in the future.

In line with Balli et al. (2013, 2014), our results suggest that interest revenues associated with long-term debt assets play a favourable role for income smoothing, especially in core countries, where income smoothing was above 16 percentage points larger during periods of “high” compared to “low” long-term debt assets. In comparison, periods of “high” long-term debt assets seem to have improved income smoothing in peripheral countries by around 6 percentage points. This heterogeneity is in line with the different sizes of the long-term debt assets portfolios across regions (Figure 7, upper panels). Equity assets do not seem to have significantly contributed to risk sharing, as the associated results are statistically non-significant. Short-term debt assets³⁰ do not matter for

³⁰The results for short-term debt assets as well as short-term debt liabilities are not shown in Figures 9 and 10 given the insignificant effects and the overall low magnitude of cross-border short-term debt holdings, but are available upon request.

income smoothing in the euro area due to their low level and rather volatile behaviour when compared with other instruments.³¹

Figure 9: Additional income smoothing in the EA10 by asset type and region, portfolio holdings, cumulative IRFs



Sources: Own calculations based on Eurostat quarterly national accounts and IMF CPIS data.

Notes: These results present the additional risk sharing via the capital channel (in percentage points) associated with periods of “high” portfolio holdings, compared to periods of “low” portfolio holdings. Results present the cumulative impulse response function associated with the interaction term in Equation (14). Solid lines plot the median value, while the band presents 95% confidence intervals.

For external portfolio liabilities, our analysis suggests that long-term debt liabilities contributed to income smoothing, both in the core and in the periphery countries (Figure 10). We observe a positive risk-sharing effect associated with periods of “high” long-term debt liabilities, which amounts to around 14 and 10 percentage points for core and periphery countries, respectively. Similarly, for equity liabilities, dividend payments contributed to income smoothing in both regions, the magnitude of the effect being 20 percentage points for core countries and 9 percentage points for the periphery. The positive income smoothing effect derived from portfolio equity liabilities might relate to the fact that dividend payments are state contingent, roughly proportional to domestic output,

³¹See Figure A.1 in the Appendix.

and behave pro-cyclically as companies pay less dividends during economic downturns, hence smoothing income through the business cycle.

Despite the significant difference in the magnitude of the cross-border equity and long-term debt portfolios in peripheral countries (Table 1), the fact that both instruments seem to have been similarly conducive for risk sharing in peripheral countries highlights the income smoothing potential of equity liabilities. All in all, our results suggest that the collapse in income smoothing suffered by these countries (Figure 6, left panel) might have been driven by the evolution of inter-regional liabilities (Figure 7, lower left panel). In fact, around the sovereign debt crisis, the most affected countries suffered sudden stops and reversals of foreign debt funding. In particular, it was in peripheral countries where, according to our analysis, the sharpest deterioration of income smoothing capacity took place. This could be linked to the fact that, during the last years, inter-regional equity investment has been rather uni-directional. It flew from southern to the northern countries, generating equity assets in southern and equity liabilities in northern countries, thus making northern countries profit more from *ex-ante* insurance in bad times. More research is needed to grasp the unique characteristics and dynamics of equity funding. Understanding better why flows have been mainly in the direction from the southern to the northern countries could be a useful avenue for further work. It could also help in tackling obstacles that hinder further cross-border equity funding in southern countries that, albeit insufficiently, seem to have positively contributed to capital risk sharing - according to our results in Figure 10.

Turning to FDI, we observe that only core countries benefited from FDI-related flows, while income smoothing in periphery countries was unaffected (Figure 11). In particular, high inward equity positions toward core countries are associated with an additional income smoothing effect of more than 20 percentage points. Outward positions also show smoothing capacity, however, the cumulative IRFs turn statistically insignificant relatively quickly. Foreign direct investment via debt³² does not play a significant role for income smoothing in the euro area due to its low level.³³

Summing up, we conclude that fluctuations in interest payments related to long-term portfolio debt assets and liabilities, as well as dividend payments stemming from equity liabilities provide significant risk sharing through the capital channel for all euro area countries included in our sample. However, the magnitude of the effect was significantly larger for core countries, which seems to relate to their more sizeable cross-border portfolios when compared to the periphery. Despite equity liabilities only representing a small share of total cross-border liabilities for both regions, these instruments are associated with a similar additional income smoothing effect when compared to long-term debt liabilities. Furthermore, the collapse in the inter-regional component of the capital channel suffered by periphery countries after the GFC seems to be related to the strong decline in the stock of inter-regional cross-border liabilities. Regarding FDI, inward equity positions played an important role for core countries, while the effect is negligible in the periphery.

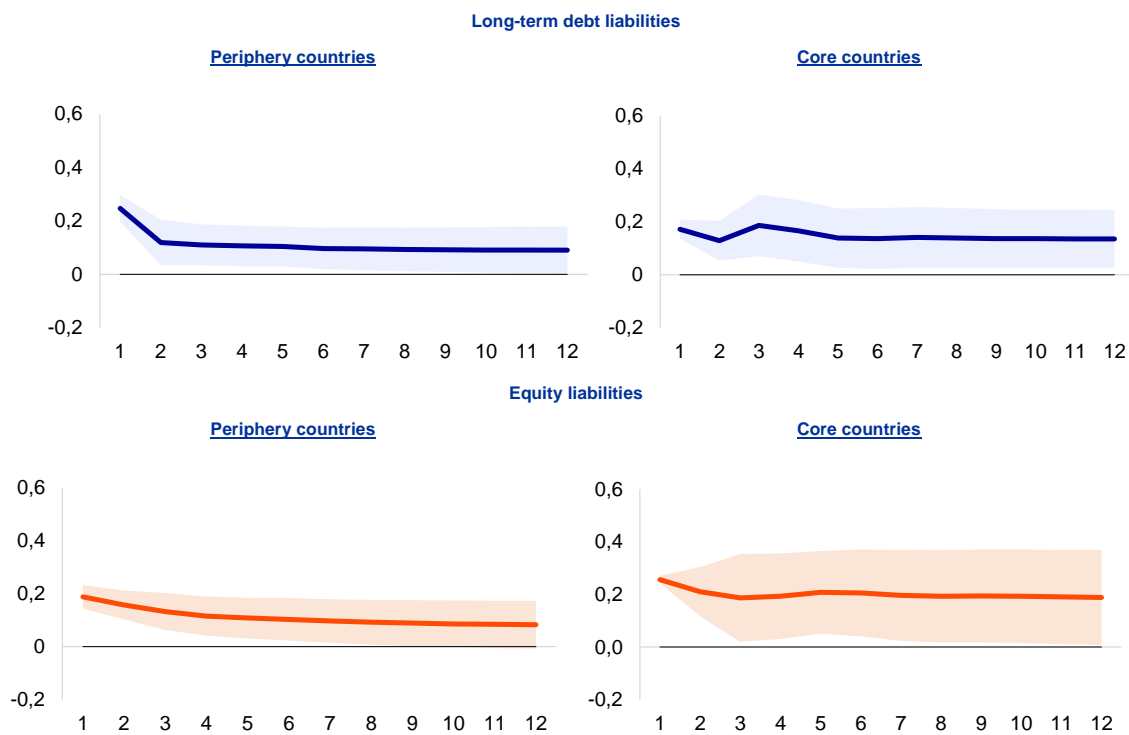
6 Conclusion and policy implications

This paper uses country-specific and panel threshold VAR models to analyse international risk sharing via capital markets and its drivers in the euro area. After providing fresh evidence on the evolution of risk sharing, especially of the capital channel, from 2000 through 2021, it contributes to the literature in two main respects. First, we split the sample into core and periphery countries, then disaggregate the capital channel into an intra- and

³²The results for both inward and outward direct investment via debt is not shown due to their insignificant effects, which relates to the overall low magnitude of these holdings, but are available upon request.

³³Figure A.2 in the Appendix.

Figure 10: Additional income smoothing in the EA10 by liability type and region, portfolio holdings, cumulative IRFs



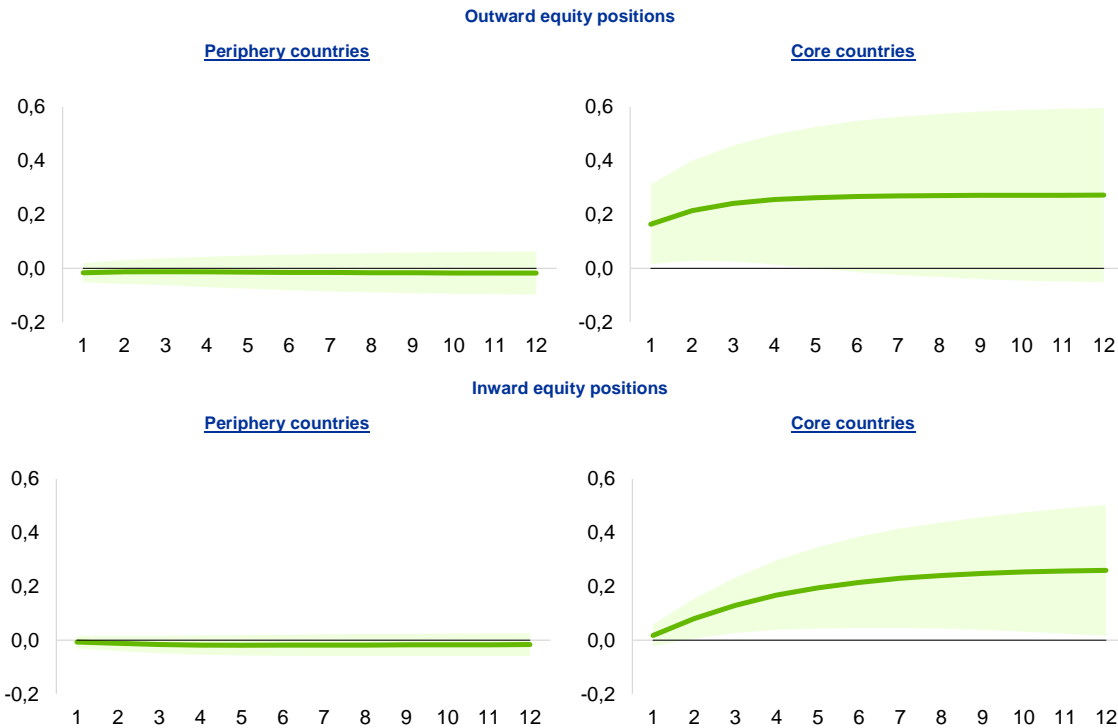
Sources: ECB calculations based on Eurostat quarterly national accounts and IMF CPIS data.

Notes: These results present the additional risk sharing via the capital channel (in percentage points) associated with periods of “high” portfolio holdings, compared to periods of “low” portfolio holdings. Results present the cumulative impulse response function associated with the interaction term in Equation (14). Solid lines plot the median value, while the band presents 95% confidence intervals.

inter-regional component; this contrasts with existing studies that focus on the euro area (or the EU) as a whole. Second, we are the first to analyse the role of the composition of foreign portfolio and direct investment positions for income smoothing in a panel threshold VAR. Related studies, in contrast, applied univariate frameworks to examine the role of external portfolio composition for international risk sharing.

Our analysis documents an improvement in income smoothing provided by capital markets across euro area countries until the GFC. Yet, the capital channel of risk sharing significantly deteriorated following the sovereign debt crisis, entirely drying up in southern countries. Given that intra-euro area cross-border capital positions remain much larger (also relative to GDP) in core countries, this region was better able to shield against country-specific shocks via capital markets than periphery countries. This gap in income smoothing has even widened since 2011.

Figure 11: Additional income smoothing in the EA10 by direction and region, FDI, cumulative IRFs



Sources: ECB calculations based on Eurostat quarterly national accounts and IMF CPIS data.

Notes: These results present the additional risk sharing via the capital channel (in percentage points) associated with periods of “high” FDI, compared to periods of “low” FDI. Results present the cumulative impulse response function associated with the interaction term in Equation (14). Solid lines plot the median value, while the band presents 95% confidence intervals.

Regarding geographical patterns, we document that income smoothing was largely supported by *intra*-regional external capital holdings during the more recent period. *Inter*-regional risk sharing was unable to provide a significant effect, particularly in periphery countries, where it even induced dis-smoothing. This might be linked to the decrease in inter-regional funding received by these countries after the sovereign debt crisis. Thus, our analysis suggests euro-area risk sharing would benefit from a closer integration between core and periphery.

Not all financial instruments provide the same risk sharing capacity. Analysing the contribution to income smoothing offered by different components of external capital positions shows that interest receipts and payments arising from long-term portfolio debt assets and liabilities as well as capital flows related to portfolio equity liabilities had a positive impact. However, this effect seems to have been more material in core countries, in line with the larger size of their cross-border portfolios than in peripheral countries. Despite the overall smaller magnitude of equity liabilities when compared to long-term debt liabilities (both for core and periphery countries),

the additional income smoothing effect associated with them is largely comparable. This suggests an increase in equity linkages between euro area countries might significantly strengthen international risk sharing. Lastly, looking at FDI, we observe that inward investment towards northern countries (as a % of GDP) was more than six times larger than that received by southern countries. This helps explain why the impact of inward FDI on income smoothing is substantial in the core countries, while no significant effect is found for the periphery.

Our results contribute to the policy debate on the need for better financial integration in the euro area and the implementation of the CMU. Showing that the capital channel still remains unexploited gives a strong rationale for furthering financial integration. Progress on the CMU could strengthen risk sharing via *ex ante* insurance relying on capital market transfers. Moreover, the resilience of the capital channel during the early stages of the pandemic bolsters the argument to focus on capital market integration and its quality. Further research could look into the most important factors driving a wedge between potential and actual risk sharing capacity, including the differences between northern and southern countries.

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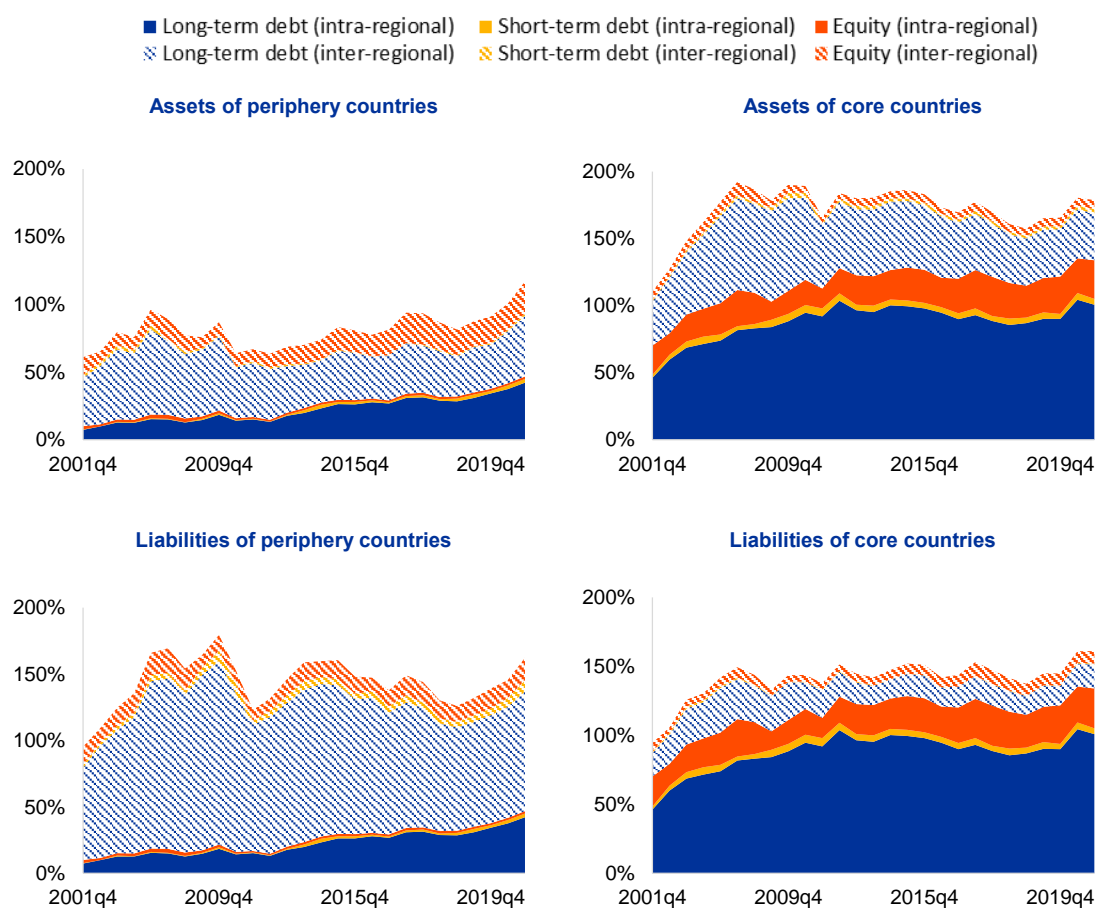
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A Appendix

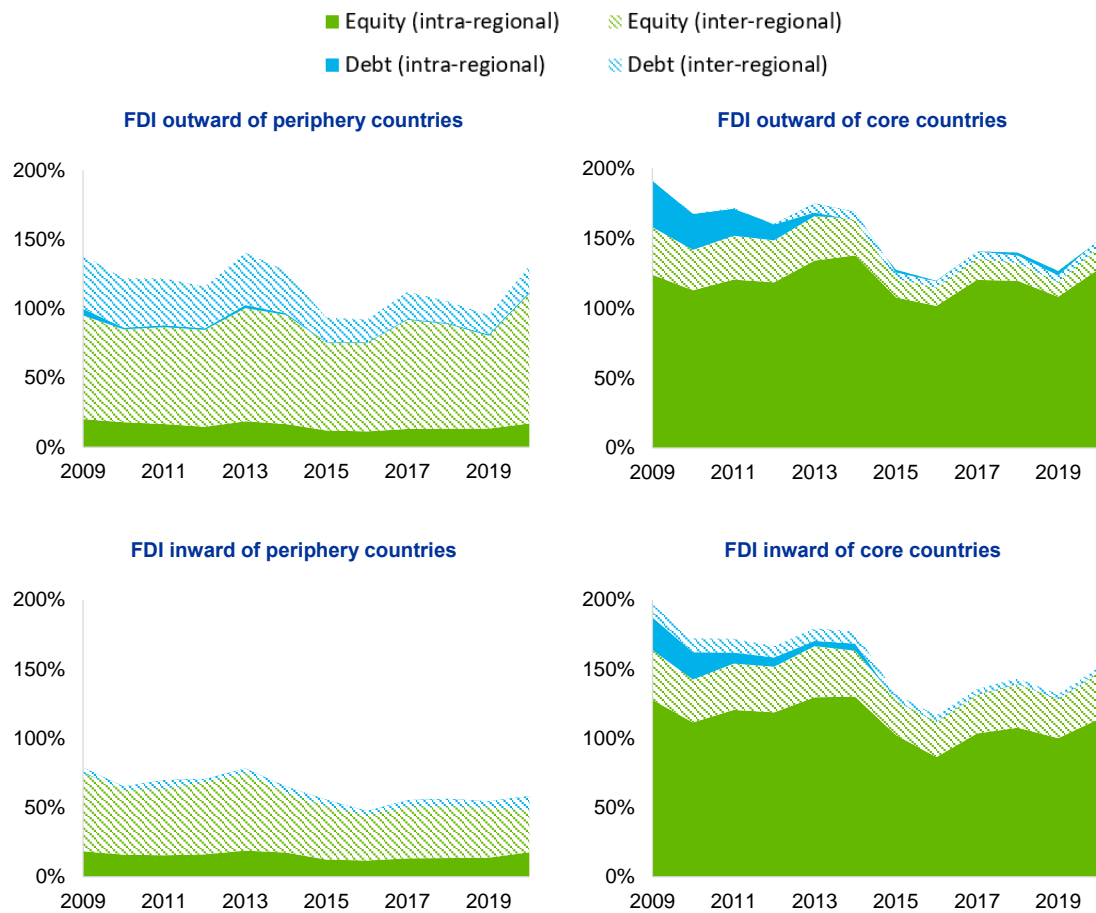
Figure A.1: Distribution of intra-EA10 cross-border portfolio holdings by regions, in percent of GDP



Sources: Sources: IMF, Coordinated Portfolio Investment Survey.

Note: The CPIS data is available annually from end-2001 to end-2012, and bi-annually starting at end-June 2013. Ratios are computed as a percentage of GDP of the region of reference.

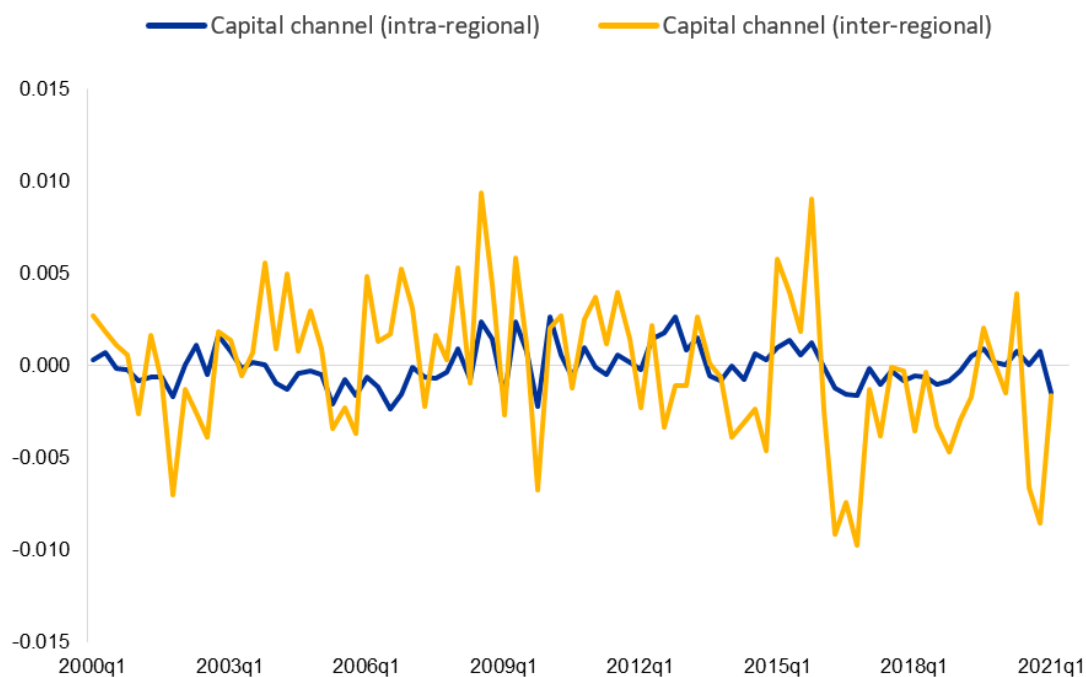
Figure A.2: Distribution of intra-EA10 cross-border direct investment holdings by regions, in percent of GDP



Sources: IMF, Coordinated Direct Investment Survey.

Note: The CDIS data is available annually from 2009 to 2020. Ratios are computed as a percentage of the GDP for the region investing abroad (i.e., the region for which the CDIS stock is labelled as “outward”).

Figure A.3: Disentangling the capital channel into intra- and inter-regional sub-components, Italy, idiosyncratic deviation



Sources: ECB calculations based on Eurostat quarterly national accounts data.

Note: Idiosyncratic deviations related to the capital channel split down by country group (i.e., intra- vs. inter-regional). This chart is for illustrative purpose only and shows the case of Italy. It provides the metrics representing the intra-regional (see Equation 10) and inter-regional (see Equation 11) components of the capital channel.

Table A.1: Thresholds per country – Portfolio holdings

Threshold variable	Threshold	Chi ²	p-value	Obs. (low)	Obs. (high)
Germany					
<i>Liabilities</i>					
Long-term debt	0.767018	7.23392	0.0072	23	4
Short-term debt	0.018392	7.82454	0.0052	4	23
Equity	0.146543	1.45712	0.2274	5	22
<i>Assets</i>					
Long-term debt	0.855064	2.31954	0.1278	4	23
Short-term debt	0.013981	3.28551	0.0699	13	14
Equity	0.160136	12.20254	0.0005	4	23
France					
<i>Liabilities</i>					
Long-term debt	0.756198	2.382851	0.1227	7	20
Short-term debt	0.034142	5.08638	0.0241	14	13
Equity	0.276967	22.81451	0.0000	6	21
<i>Assets</i>					
Long-term debt	1.641897	5.23760	0.0221	23	4
Short-term debt	0.148491	5.23760	0.0221	18	9
Equity	0.283113	22.81451	0.0000	16	11
Italy					
<i>Liabilities</i>					
Long-term debt	1.196114	4.34742	0.0371	19	8
Short-term debt	0.042535	0.70149	0.4023	14	13
Equity	0.107460	0.64711	0.4211	11	16
<i>Assets</i>					
Long-term debt	0.488033	3.79073	0.0515	4	23
Short-term debt	0.006155	0.95718	0.3279	6	21
Equity	0.132928	1.22969	0.2675	16	11
Spain					
<i>Liabilities</i>					
Long-term debt	1.320851	11.04623	0.0009	9	18
Short-term debt	0.071799	8.39323	0.0038	14	13
Equity	0.163257	4.05236	0.0441	4	23
<i>Assets</i>					
Long-term debt	0.489723	3.79021	0.0515	8	19
Short-term debt	0.033154	3.69209	0.0547	21	6
Equity	0.169539	4.29498	0.0382	14	13

Information related to the remaining countries is available upon request. This p-value relates to the Wald test. The null hypothesis refers to the existence of no significant difference between regimes.

Table A.2: Thresholds per country – Direct investment holdings

Threshold variable	Threshold	Chi ²	p-value	Obs. (low)	Obs. (high)
Germany					
<i>Outward</i>					
Equity	0.458582	7.96208	0.0048	3	9
Debt	0.245277	2.82172	0.0200	3	9
<i>Inward</i>					
Equity	1.004547	0.60009	0.4383	8	4
Debt	-0.236268	3.32741	0.0681	3	9
France					
<i>Outward</i>					
Equity	0.627143	0.39443	0.5300	4	8
Debt	0.107241	1.24131	0.2652	5	7
<i>Inward</i>					
Equity	1.259925	0.54245	0.4614	8	4
Debt	-0.032289	9.29431	0.0023	3	9
Italy					
<i>Outward</i>					
Equity	0.708277	4.661004	0.0309	8	4
Debt	0.093524	3.33561	9.9678	3	9
<i>Inward</i>					
Equity	0.744655	0.921903	0.3370	7	5
Debt	-0.00944	1.102727	0.2937	3	9
Spain					
<i>Outward</i>					
Equity	1.163935	2.089844	0.1483	6	6
Debt	0.5683	7.104288	0.0077	7	5
<i>Inward</i>					
Equity	0.600051	3.56567	0.0590	7	5
Debt	-0.157984	8.21176	0.0042	3	9

Information related to the remaining countries is available upon request. This p-value relates to the Wald test. The null hypothesis refers to the existence of no significant difference between regimes.

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Chapter 5

Foreign direct investment openness and
income classes in Europe around the Great
Recession

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Summary: Distributional implications of capital account regulation is eminently context-specific. This paper examines the distributional effects of the openness of foreign direct investment (FDI) flows across 27 European countries in different economic environments around the Great Recession, covering the period 2007–2013. Our multi-level approach allows us to combine country-level variables and sociodemographic characteristics of individuals. The results highlight that the openness of FDI flows heterogeneously affects the income share of individual groups, favouring in particular the highest income classes. This finding seems to be driven by the educational level. We argue that even though highly educated individuals are present along the entire distribution, the highest income classes are especially favoured by the openness of FDI flows. This biased distributional effect of the openness of FDI flows persists throughout the years examined, regardless of the economic environment; this is due, in part, to the fact that the distribution of highly educated people is not sensitive to the business cycle.

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Conclusions

I. Final conclusions and closing remarks

This doctoral thesis contributes to evaluating the macroeconomic stabilisation effect exerted by monetary policy and financial markets and the potential implications for income inequality. This research addresses the theoretical framework and provide evidence to empirically analyze the main transmission mechanisms through which these two areas might affect the distribution of income.

In recent years, the connections between monetary policy and the challenges associated to inequality and the climate crisis have been gaining prominence both in the economic literature and in the political debate. In line with the inclusive and sustainable growth paradigm underlying the 2030 Agenda, the first chapter provides a review of the theoretical and conceptual frameworks that link monetary policy and the paradigm of inclusive and sustainable growth. The different channels through which monetary policy might not only affect but also be affected by equity and environmental aspects are also examined. The hypothesis that monetary policy is not neutral for the distribution of income is empirically addressed in the subsequent chapters. In particular, the second chapter highlights that the expansionary measures implemented by the European Central Bank in the years around the GFC and the subsequent recession had a heterogeneous impact across income classes. Overall, monetary policy seems to have exerted a macroeconomic stabilisation effect via the labour market, contributing to limiting the employment deterioration, particularly for low-income households. However, this positive effect witnessed by most vulnerable households seems to have only partially compensated for the disproportionate impact they tend to suffer during downturns. In this regard, chapter three finds that monetary policy support has only allowed low-income classes to remain in their class, while falling short of allowing them to move upwards across the income ladder. Furthermore, when considering both labour and capital income, this investigation suggests that expansionary monetary policy has also helped the richer preserve their relative status by decreasing their downward mobility.

Amidst the growing consensus on the important connections between monetary policy and inequality, it is nontrivial to question whether monetary policy could or should contribute to supporting inclusive growth. The first part of this dissertation presents arguments and provides empirical evidence that highlight the relevance and potential feasibility of monetary policy paying more attention to rising inequality with the aim of

enriching the evidence available to policymakers. Without prejudice of the objective of price stability, we argue that rethinking monetary policy amidst some of the great challenges of our times, namely intra- and inter-generational equity, should be seriously considered by academics and policymakers.

Besides monetary policy, financial markets also exert macroeconomic effects that could limit the deterioration of the real economy during downturns and foster recoveries. In particular, capital markets enable the flow of financial resources between countries, which could provide an important international risk sharing effect. This aspect is empirically addressed in the fourth chapter, which suggests that despite the improvement since the early 2000s, shock absorption through capital markets remains rather modest in the euro area. From an international risk sharing perspective, in the context of the Capital Markets Union, initiatives contributing to fostering financial integration could strengthen countries' ability to insure against domestic macroeconomic fluctuations via cross-border capital transfers. The existence of "inequality hysteresis" implies that the counter-cyclical macroeconomic effect exerted by capital flows would also have positive implications for inequality at an aggregate level. However, from a macroeconomic stabilisation perspective, not all financial flows are equally desired. In this regard, the implications of foreign direct investment (FDI) flows, usually driven by long-term investment strategies, could differ vis-à-vis that of short-term flows driven by arbitrage strategies. Chapter 5 focuses on capital account regulation and suggests that FDI flows supported by past openness measures might have increased income inequality by especially favouring highly educated workers, which are more likely to be in the upper classes.

In summary, this investigation unveils the extent to which monetary policy and international financial markets seem to have affected the recent evolution of income inequality in the euro area. Beyond the aforementioned general conclusions, we now present a series of specific conclusions associated to the different chapters that compose the dissertation.

The conclusions of the first chapter are:

- The research examined in this chapter reveals the importance of not only the pace but also the pattern of growth in terms of equity and environmental sustainability. At the country level, this involves identifying and implementing specific national policies so as to transition towards more inclusive and sustainable growth paths, to avoid

economic growth taking place at the expense of the most disadvantaged population groups or generating environmental problems.

- While inclusive and sustainable growth requires comprehensive approaches based on a wide range of public policies, it seems clear that monetary policy has important implications in the current juncture. This chapter explores the linkages between monetary policy and both economic inequality and environmental concerns and reveals many studies argue that monetary policies are not neutral for economic inequality and environmental risks.
- Beyond ethical aspects of whether monetary policy should take distributional and environmental challenges into consideration in its decision-making, our analysis supplies numerous arguments in favour of having monetary policy pay more attention to income and wealth inequality and environmental degradation and climate change than in the past. Rethinking monetary policy in terms of intra- and inter-generational equity, therefore, not only seems necessary, but also essential to contribute to meeting the SDGs, and as such should be seriously considered by academics and monetary policymakers.

The second chapter provides the following conclusions:

- This investigation uncovers the heterogeneous impact of ECB monetary policy across income classes in the euro area. Although the traditional view states that monetary policy is neutral or nearly so over the business cycle, the recent literature reveals that cyclical and trend changes are hardly ever independent. The data used in this research suggests the existence of scarring effects in the labour market. On the one hand, regarding the unemployment rate, we observe that workers located in the leftmost part of the income distribution were both the first ones to exit the labour market (already in 2008) and the last ones to re-enter it during the recovery (only in 2017). Furthermore, these households suffered the largest increase in unemployment rate. When looking at the entire business cycle, also including the full recovery up to 2019, we observe the cyclical deterioration disproportionately suffered by the lower class is not fully reversed, as post-crisis unemployment remained above pre-crisis figures, leading to scarring or hysteresis effects. On the other hand, real labour income displayed a different behaviour by income classes. In particular, wage growth decreased and then stagnated for a long period of time, and it remained around 5-10% below pre-crisis levels for seven years in a row (only started recovering in 2016). Both

the deterioration and the recovery were more positive for the rest of the income classes. Consequently, the widening in wage dispersion witnessed during the recession was not fully reversed after the recovery phase, and part of it remained in 2019.

- The response of unemployment rate to monetary easing shocks is largely unequal across income classes. In particular, the lower class displays the largest reaction in size, and thus benefits from the sharpest decline in unemployment rate. The magnitude of the impact becomes smaller as we move towards the rightmost side of the income distribution, being more moderate for both the middle-lower and the middle-upper classes, while the unemployment rate of the upper class does not seem to be significantly affected. This reveals that the greater economic activity promoted by expansionary monetary policy materialized in more employment opportunities that seem to have been unevenly distributed across income classes, particularly favouring the most vulnerable households. Therefore, over the past economic cycle, monetary easing seems to have helped contain income inequality via the extensive margin (i.e., employment opportunities) of the labour market. This effect seems to have been particularly sizeable for the case of Ireland, Luxembourg, and Spain, while being more moderate for Finland, Germany and the Netherlands. Differences across countries seem to relate to the sensitivity of the employment rate to the business cycle over the period analysed.
- The response of real labour income to monetary easing shocks also differs by income classes. The analysis highlights that the labour income earned by the lower class has not been significantly affected by monetary easing shocks. From its side, the middle classes do seem to benefit from a positive effect on their wages, but the impact is rather moderate and appears with a lag. This contrasts with the dynamic shown by the upper class, for which the impact is larger and materializes earlier in time. This suggests expansionary monetary policy might have exacerbated income inequality via the intensive margin (i.e., salaries), as higher-income classes enjoyed larger positive effects, while wages accrued by low-income households have been rather unresponsive to the easing shocks. In this regard, upper classes in France, Ireland, Italy, Luxembourg and Spain seem to have enjoyed the larger benefits.
- This analysis highlights that expansionary monetary policy seems to have decreased income inequality via the extensive margin (i.e., unemployment rate) of the labour market, while increasing disparities across income classes via the intensive margin (i.e., salaries). When looking at the total impact, we observe the inequality-decreasing

effect of the extensive margin largely predominates. In a second analysis, this investigation takes a step further and tries to understand to what extent this inequality-decreasing effect is due to the reaction of the job separation rate (i.e., employed people becoming less likely to lose their jobs) or rather relates to the job finding rate (i.e., unemployed people becoming more likely to find a job). This analysis confirms that the employment status of poorer workers is substantially more elastic to policy shocks, with the differential impact across income classes being largely driven by a substantially stronger improvement in job finding rates for those located at the bottom of the income distribution. In contrast, the positive impact of monetary easing on job separation rates have been rather homogeneous across the distribution.

- This investigation concludes expansionary monetary policy has helped decrease labour income inequality, as the positive impact via the extensive margin (i.e., improving labour opportunities for the poorer) has largely offset the comparatively minor increase in inequality driven by the intensive margin (i.e., improving wages earned by better-off households). Essentially, looking at the employment status, a monetary easing shock seems to particularly support employment for those at the leftmost part of the income distribution. Looking at real salaries, most vulnerable households do not seem to increase following a monetary easing shock, while upper-class' salaries do. While these findings qualitatively hold for all countries that compose our sample, our analyses uncover significant differences across countries, highlighting differing labour market dynamics across countries. In particular, countries where unemployment rate and real wages fluctuated the most during the economic cycle are those for which the largest impacts are estimated (see e.g., Ireland, Luxembourg, Spain and Portugal). Aspects related to labour market flexibility also shape how wages react to countercyclical monetary policy.

The main *take-aways* of chapter three includes:

- The observation of the income mobility indicators derived from EU-SILC data shows upward and downward mobility figures are not uniform across the countries composing the sample. Dispersion is larger for the case of the downward mobility rates, which in some countries are 3.5 times larger when compared to other countries in the same year. Reasons explaining these disparities include structural and institutional features prevailing in each country.

- During the period under review (2004-2015), the data reveals a general descending trend in both upward and downward mobility in almost all countries, pointing towards an increasing preservation of the status quo. This appears to be the case for all countries with the exception of Portugal and Luxembourg which display a differential trend. In Portugal, both upward and downward mobility present a structural shift around 2008-2009, when they stabilized around levels well above those prevailing before the GFC. For the case of Luxembourg, both mobilities oscillated rather horizontally during most of the years, but then underwent a sharp year-on-year increase between 2014 and 2015.
- Looking at the entire population, we observe a negative (expansionary) shock to real long-term interest rates seem to encourage upward mobility (percentage of the population that experiences movements of two or more deciles upwards) while discouraging downward mobility (percentage of the population that experiences movements of two or more deciles down).
- Looking at the specific results for each of the income classes, we observe the impact of ECB monetary policy on income mobility differs across income classes. For the lower part of the income distribution, results are not statistically significant, suggesting monetary policy might not have had a significant impact on the upward mobility of the lower class. This might suggest that benefits reaped by individuals at the bottom of the income when monetary easing is applied might, if any, only allow them to preserve their relative position within their own decile, while not capitalising on it for significantly moving upwards across the income ladder.
- Regarding the middle classes, monetary policy seems to have been especially favourable as past expansionary shocks might boost upward mobility. A detailed analysis of the middle class shows that an expansionary monetary policy may propel the upward mobility and hinder the downward mobility of the lower-middle class, particularly favouring this income group. For the lower-middle class, the analysis reveals an expansionary monetary policy shock leads to greater upward mobility and a lower downward mobility. However, results for the upper-middle class appear to be not statistically significant.
- For the case of the upper class, monetary easing seems to decrease its downward mobility. This reduction of the downward mobility suffered by the upper class is consistent with the literature suggesting that unconventional policy seems to increase the capital income of the rich.

From chapter four, the following conclusions emerge:

- The evidence suggests that the contribution of cross-border capital markets to international risk sharing in the euro area remains largely unexploited, particularly compared to a long-established monetary union like the United States (US). Despite the improvement following the creation of the European Monetary Union, which created cross-border investment opportunities and contributed to greater ownership diversification, capital markets have only been able to smooth out around 5-10% of idiosyncratic fluctuations in GDP over the past two decades. This stands in stark contrast to the US, where contribution of the capital channel of risk sharing has been between three and five times greater.
- The results indicate that the credit channel has historically been the most important mechanism for cross-border risk sharing in the euro area, even though it was temporarily impaired during the Global Financial Crisis (GFC) and the subsequent sovereign debt crisis. During this period, the credit outlook of the most affected countries deteriorated, and financial markets tightened, reducing financial flows across euro area countries and impairing risk sharing via the credit channel.
- International risk sharing via capital markets varies significantly across euro area countries and presents regional similarities. In particular, the contribution of the capital channel is significantly lower in southern countries (ES, GR, IT, PT) than in northern countries (AT, BE, DE, FI, FR, NL). The sizes of the cross-border capital positions (i.e., “de facto” financial integration) partially explain this finding, with portfolios held by northern countries (as a percentage of GDP) being around twice as large as those held by southern countries. A similar difference is observed for direct investment holdings.
- The analyses allow to disentangle the contribution to risk sharing made by intra-regional flows (i.e., net factor income flows between countries belonging to the same region) and inter-regional flows (i.e., net factor income flows between countries belonging to different regions). In southern countries, the improvement of risk sharing via the capital channels over the period 2000-2012 was mainly due to inter-regional flows. However, since the GFC, the inter-regional capital channel has declined markedly, even becoming negative in the last ten years, indicating a dis-smoothing effect (i.e., exacerbating rather than smoothing out idiosyncratic fluctuations in GDP). This collapse seems to be related to the strong decline in inter-regional cross-border

liabilities suffered by southern countries. In the recent years, the intra-regional contribution has been increasing, but it has only compensated for the negative contribution of the inter-regional flows. As a result, the total effect of the capital channel to risk sharing in southern countries is estimated to be zero. This contrasts with the situation in northern countries, where the collapse of the inter-regional risk sharing during the recession was less pronounced, and the larger contributions of intra-regional flows allowed the capital channel to smooth out around 6% of idiosyncratic shocks to GDP in the last years of our sample.

- Looking at the composition of cross-border portfolios (CPIS data), the investigation concludes that the fluctuations in interest payments related to long-term portfolio debt assets and liabilities, as well as dividend payments stemming from equity liabilities, have provided significant risk sharing effect. However, and in line with the relative size of these portfolios, the contribution has been much larger for northern countries. Interestingly, despite equity liabilities only representing a small share of total cross border liabilities for both regions (9% and 17% for southern and northern countries, respectively), these instruments are associated with a similar additional risk sharing effect compared to long-term debt liabilities (85% and 79%, respectively).
- Looking at foreign direct investment holdings (CDIS data), this research highlights capital inflows stemming from inward equity positions played an important role in risk sharing in core countries, while the effect seems to be negligible in the periphery. The explanation lies in the relative sizes of FDI flows, with inward investment towards northern countries (as a % of GDP) being more than six times larger than that received by southern countries.
- This investigation has important implications for the policy debate on the need for better-integrated financial markets in the euro area and the implementation of the Capital Markets Union (CMU). The results highlight that the risk sharing capacity of the capital channel remains largely unexploited, reinforcing the quest for further financial integration. According to this research, financial integration boosting cross-border exposures of equity instruments, which provide an ex-ante insurance capacity, might be particularly beneficial from a risk sharing perspective.

Chapter 5 presents the following main ideas:

- This analysis of the relationship between capital account liberalization and income distribution highlights that FDI openness seems to benefit all income classes. Despite

the effect being positive for the entire population, the magnitude differs, suggesting that the effects of FDI openness on income share are heterogeneous along the income distribution and appear to have mostly benefitted the upper class. Then, the magnitude becomes progressively smaller as we move towards the leftmost side of the income distribution, leading to an overall inequality-increasing impact.

- The capital-skill complementarity hypothesis tested throughout the investigation suggests that the liberalisation of FDI flows in advanced economies might particularly benefit highly skilled domestic workers, as they are both (i) more likely to act as a complement to capital inflows and (ii) less likely to be affected by FDI outflows seeking to outsource labour-intensive processes to emerging countries with lower wages. The results validate this hypothesis, as they uncover the key role played by the education level in shaping the relationship between the openness of FDI and the income share of individuals. In particular, households with a higher percentage of highly educated individuals benefit more than poorly educated households from said openness. This entails a disproportionately greater increase of the income share for the upper class, as highly educated individuals are not randomly distributed across the population, but are instead overrepresented in the upper part of the distribution.
- The findings suggest that capital account liberalisation affecting FDI policies tends to enhance income inequality via the capital-skill complementarity hypothesis, and this effect highly persistent for all years in our sample, i.e., between 2007 and 2013. The fact that this distributional effect persists throughout the years examined, regardless of the economic environment (pre-, acute-, and post-crisis situations) might be due, in part, to the fact that the distribution of highly educated people is not sensitive to the business cycle.
- This study has important implications from a policy point of view. The results reveal that the distribution of education, as a significant source of inequality of opportunity, constitutes a central element when examining the links between financial liberalization in FDI flows and income inequality. Therefore, beyond policy decisions on the degree of capital account liberalisation, larger and more equitable investment in education that helps to create a more level playing field for all members of society might be regarded as a key public intervention that can shape the relationship between the openness of FDI and income inequality among income classes.

II. Limitations and future research

Limitations associated with chapter 1 are:

- The literature reviewed during this investigation was produced during the “Great Moderation” years and, subsequently, in the context of the low interest rates environment in Europe. In the current juncture of sustained inflation above the target set by central banks and rising policy rates, the potential linkages between monetary policy and both wealth and income inequality and environmental concerns should be revisited.
- The research focusing on the relationship between climate change and monetary policy that has been produced so far is mostly of a qualitative nature due to existing data limitations. Among other initiatives, the ECB published a set of climate-related statistical indicators on its website in January 2023 for the first time, covering sustainable finance, carbon emissions and physical risks, which could help strengthen empirical evidence in this area.

Regarding chapter 2, potential limitations include:

- The transmission mechanisms through which monetary policy might affect inequality are numerous, as detailed throughout chapter 1. These complex dynamics can be disentangled into specific channels affecting both the distribution of income and the distribution of wealth. In this regard, the focus of this paper is on the income distribution and, within it, the channels that operate via the labour market (i.e., income composition and earnings heterogeneity channels). By focusing on labour income inequality, we leave outside our analysis other areas that are worth exploring. Future complementary research might consider, on the one hand, the potential distributional effects of monetary policy that operate through the response of different (non-labour) types of income, such as financial and business gains.
- The concept of income used is that of household market income (i.e., before transfers and taxes). This definition includes all income from work (salaries of employees and income of self-employed workers), income from capital and property, transfers between households, as well as income from private pension plans. This research focuses on households actively participating in the labour market, for which market income throughout the sample is above zero. In this regard, future research could

adopt a broader view and explore the impact of ECB monetary policy on the different income classes, including households that do not earn wages but instead derive their income entirely from other sources (e.g., pensioners and purely capitalist households).

- The analysis provides estimates of the class-specific impact of monetary policy shocks. For this purpose, households are classified by income class based on their distance towards the median disposable income. In this way, we distinguish between the lower, lower-middle, upper-middle, and upper classes. Recent evidence for Denmark (see Andersen et al., 2023) uncovers heterogeneity in the response of labour income within the lower class. In this vein, future research will seek to disentangle further this segment of the population to provide a deeper analysis of the transmission of monetary policy.
- The time dimension of this analysis captures the recession period and the subsequent recovery before the COVID-19 crisis. Throughout this period, the European Central Bank implemented both conventional and unconventional monetary policy tools to support the economy. The objective of this paper is to capture the joint impact of all the measures applied during these years to provide a holistic view of their distributive implications. The findings of this investigation might be complemented by additional analyses trying to detail whether the different types of monetary policy have diverged with respect to their impact on labour income inequality.

These are the limitations of chapter three:

- The EU-SILC has the advantage of collecting detailed information on individual and household income, and the data are comparable across the participating European countries. However, the longitudinal component only follows individuals for four consecutive waves, which implies that each year 25% of the sample is replaced by a new rotational group. As mobility measures are based on income changes over two consecutive years of data, the effects of attrition are greatly muted as compared to other measures based on longer sequences of panel data.
- As it is the case for the second chapter, the concept of income used is that of household market income (i.e., before transfers and taxes). This definition includes all income from work (salaries of employees and income of self-employed workers), income from capital and property, transfers between households, as well as income from private pension plans. However, not all sources of income are equally important for the different income classes: while the market income accrued by the lower- and lower-

income classes mainly come from labour income the upper classes tend to derive a larger share of their income from capital gains. Future research could also explore how the impact of ECB monetary policy on income mobility is driven by its effects on the different sources of income.

- Mobility is defined in relative terms and changes in individuals' relative position are measured via transition matrices. The transition matrix is constructed by first dividing the income range of each marginal distribution into deciles (i.e., ten categories) and cross tabulating the relative frequency of observations within each matrix cell. This approach allows us to estimate separately the percentage of individuals that descend in the scale and those who ascend. However, this approach has the disadvantage of losing information on both the changes that occur within the same decile and the magnitude of the income variation that the change in decile implies. Further complementary research could seek to address these limitations.
- The longitudinal files of EU-SILC do not provide information for Germany, so future analysis could consider exploring the extent to which alternative national specific databases contain information that allows replicating the analysis for this country.

Chapter four faces the following limitations:

- The empirical literature measures risk sharing as the percentage of the total country-specific (idiosyncratic) fluctuations of GDP growth (i.e., the “diversifiable” component of risk) that is smoothed out via the financial flows that represent each of the channels (e.g., net factor income represents the capital channel). In this vein, the definition of diversifiable risk is always contingent to the benchmark countries and, consequently, the results need to be carefully interpreted as just measuring risk sharing among the countries included in each specific sample. Future research might tackle a systematic revision of risk sharing and its evolution across different samples, thereby complementing our contribution by considering, for example, all euro area countries, the European Union, and the entire world.
- The analysis on the composition of the cross-border portfolios is based on CPIS and CDIS data. These datasets might provide a biased view on both total and bilateral portfolio linkages across the countries in our sample due to the financial activity taking place in the onshore-offshore financial centres in the euro area (namely, Ireland, Luxembourg and the Netherlands), where most European investment funds reside. As an example of this bias, indirect or intermediated bilateral linkages such as German

shares held by an investment fund based in the Netherlands are interpreted as bilateral flows between this country and Germany (thus not accounting for the residence of the ultimate owner of the shares). This investigation purposely abstains from accounting for such linkages, as previous literature has revealed the existence of complex caveats and difficulties mostly related to the lack of granular and comparable data across countries, as well as to the wide set of assumptions that would need to be made to provide estimates of such “indirect” linkages. Further analyses could leverage the surging efforts to produce national estimates, such as Felettigh and Monti (2008) and Della Corte et. Al (2018) for the case of Italy.

- In this literature, the evolution of risk sharing is usually estimated using two techniques. On the one hand, some authors employ static models via seemingly unrelated regressions (SUR), estimated for each period separately, thereby only exploiting the cross-sectional dimension in the data. On the other hand, others prefer time series analysis and use vector autoregression (VAR) models, performing sequential estimates over limited sub-samples following a rolling window approach. Unlike SUR, the VAR approach accounts for the existing endogeneity among the different channels. However, this benefit does not come free of cost but entails some drawbacks related to timeliness and time precision. In particular, the use of the VAR methodology implies a specific estimate cannot be attributed to an exact period, as it results from a model which includes data over certain time frame. Consequently, the last estimate provided by our rolling window approach emanates from the sample between 2012Q2 and 2021Q1, and thus does not provide a timely and precise view on e.g., risk sharing during the COVID-19 period.
- The best alternative for estimating the contribution of the different instruments to risk sharing via capital markets would be by disentangling capital flows on an instrument-by-instrument basis. However, due to the lack of data, we need to work with stock data (CPIS and CDIS) provided by the IMF. In order to provide a hint on the extent to which the different instruments have contributed to fluctuations in the risk sharing effect provided by capital markets, we employ a threshold VAR, which accounts for nonlinearities. In particular, for each of the instruments considered in our analyses, we use the stock variables (as a % of GDP) to define, for each of the countries analyzed, two regimes: a regime where the relative holding of that instrument is considered to be “high” and a regime where this metric is considered to be “low”. The threshold level is endogenously revealed by the data following the methodology by Hansen

(1999), which simultaneously tests the existence of a threshold effect and detects the level of the threshold variable creating the nonlinearity. The optimal threshold is the one that minimizes the sum of squared errors following a likelihood ratio test. Subsequently, our results reflect the additional contribution of the capital channel during the “high” holdings regime when compared to the “low” holdings regime. Availability of financial flows by instrument could allow a more precise analysis of the country-specific contribution to risk sharing. Furthermore, future research could investigate the most important factors driving a wedge between potential and actual risk sharing capacity, including differences between countries.

Limitations associated to chapter five are the following:

- This investigation focuses on examining the capital-skill complementary hypothesis as a crucial channel linking financial liberalization and income inequality. For this purpose, the analysis is restricted to FDI openness measures due to the idea that FDI flows tend to support long-term development of the domestic business environment, capital formation, knowledge transfer, productivity, and growth in host countries. Consequently, other types of financial flows, which are believed to be driven by more volatile strategies, are excluded from our analysis. For example, debt flows might serve short-term investment intentions and hence be prone to behave pro-cyclically. Future research might focus on exploring these other channels, including the potential distributive consequences via e.g., the impact on financial stability. In general, there are numerous instruments and mechanisms through which capital flows liberalization can affect income distribution are many, and further research would be required to delve into these potential channels.
- The linkages between capital liberalization and income inequality are highly contingent on specific situations and circumstances. Consequently, the findings of this investigation should not be generalised across the globe. Rather than deriving results that hold universally, the literature aims to identify contingent effects. This is particularly the case if the study were to be replicated in different economic areas, such as emerging countries, where the importance of other mechanisms, like the implications of capital flow liberalization on the accumulation of international financial reserves by the central banks and their consequences, may be more significant. Additionally, the educational channel should be explored within each particular socioeconomic context.

- Firstly, the paper primarily focuses on examining the capital- skill complementary hypothesis as a crucial channel in the European context, although there are many mechanisms through which capital flow liberalization can affect income distribution. More research, therefore, would be required to delve into other potential channels.
- Secondly, different types of financial flows are backed by heterogeneous strategies, and, therefore, bring about different distributive consequences. For instance, debt flows might serve short-term investment intentions and hence be prone to severe reversals during downturns, whereas foreign direct investment in the form of equity might seek a rather long-lasting development of the domestic business environment.
- Thirdly, as a measure of capital flow liberalization, the study uses the de jure capital account liberalisation index, published annually by the IMF, which focuses on the openness of capital account with respect to the specific FDI asset category. Nevertheless, shorter-term capital flows which are more prone to be driven by arbitrage strategies and, on average, less associated with real economy goals than FDI, are not considered. Additionally, our approach of examining distributional impacts considering the situation of each individual within the income distribution is based on a relative definition of income classes that employs conventionally accepted income thresholds. Although relevant robust tests have been performed using alternative definitions of income classes, a broader analysis of alternative approaches to determine socioeconomic classes could also be beneficial.

Future research could explore the following areas:

- Throughout the first part of the dissertation, the first three chapters analyse the existing literature and provide additional evidence on the potential effects of expansionary monetary policy on income inequality. Specifically, the focus is on the period between the Global Financial Crisis and the outbreak of the COVID-19 pandemic, during which key policy rates decreased into negative territory, and unconventional monetary policy tools aimed at enhancing the transmission of the easing monetary stance were applied. With the emergence of above-target inflation after the pandemic, the European Central Bank has adjusted its strategy by increasing rates since mid-2022. Consequently, the implications of contractionary monetary policy might not necessarily mirror those associated with expansionary periods, thus necessitating specific analysis. This future line of investigation is crucial for generating empirical evidence to inform monetary policymaking during present and future

tightening cycles. Additionally, recent studies such as that by Moawad and Oesch (2023), suggest that the primary economic losers in recent decades have not been the lower and lower-middle class, but rather the working class, defined by occupation rather than by income levels. In a similar direction, recent evidence (see e.g., Andersen et al., 2023) uncovers heterogeneity in the response of labour income to monetary policy impulses within the lower class. Therefore, future research may entail a more detailed breakdown of the groups and a redefinition of classes based on occupation-related indicators. Furthermore, the consideration of additional factors such as age, race, and education level could contribute to clarifying how different individuals are uniquely affected by policies.

- In the second part of the dissertation, the fourth and fifth chapters focus on capital markets and examine their heterogeneous implications for the different income classes. This exploration is developed from both the macroeconomic perspective, addressing the topic of international risk sharing, and a microeconomic perspective, analysing the impact FDI inflows and outflows across income classes. However, these investigations overlook the potential implications of other types of financial flows, such as credit flows via cross-border bank credit and capital flows apart from direct investments, which should also be considered in future research.

Conclusiones

I. Conclusiones y observaciones finales

Esta tesis doctoral contribuye a la evaluación del efecto de estabilización macroeconómica ejercido por la política monetaria y los mercados financieros y sus posibles implicaciones para la desigualdad de la renta. En este sentido, se establece el marco teórico y se aporta evidencia empírica para los principales mecanismos de transmisión a través de los cuales estas dos áreas podrían afectar a la distribución de la renta.

En los últimos años, las conexiones entre la política monetaria y los retos asociados a la desigualdad y la crisis climática han ido ganando protagonismo tanto en la literatura económica como en el debate político. En línea con el paradigma de crecimiento inclusivo y sostenible que subyace en la Agenda 2030, el primer capítulo ofrece una revisión de los marcos teóricos y conceptuales que vinculan la política monetaria con el paradigma de crecimiento inclusivo y sostenible. A este respecto, también se examinan los distintos canales a través de los cuales la política monetaria podría no sólo afectar a la equidad y al medio ambiente, sino también verse afectada por ambos. A continuación, en los dos capítulos siguientes se aborda empíricamente la hipótesis de que la política monetaria no es neutral para la distribución de la renta. En particular, el segundo capítulo pone de relieve que las medidas expansivas aplicadas por el Banco Central Europeo durante la Crisis Financiera Global (CFG) y la posterior recesión tuvieron un impacto heterogéneo sobre las distintas clases de renta. En general, la política monetaria parece haber ejercido un efecto de estabilización macroeconómica a través del mercado de trabajo, por el cual ha contribuido a limitar el deterioro del empleo, especialmente en el caso de los hogares de renta baja. Sin embargo, este efecto positivo de la política monetaria parece haber compensado sólo parcialmente el impacto desproporcionado que suelen sufrir los hogares más vulnerables durante las recesiones. En este sentido, el capítulo tres concluye que el apoyo de la política monetaria sólo ha permitido a las clases de renta baja mantener su posición relativa con respecto a las demás clases de renta, mientras que no les ha permitido ascender en la escala de ingresos. Además, al analizar de forma conjunta las rentas del trabajo y las del capital, esta investigación sugiere que la política monetaria expansiva también ha ayudado a los más ricos a preservar su estatus relativo al disminuir su movilidad descendente.

Dado el creciente consenso sobre la importancia de las conexiones entre política monetaria y desigualdad, no parece trivial preguntarse si la política monetaria podría o debería contribuir a apoyar el crecimiento inclusivo. En la primera parte de esta disertación

se presentan los argumentos principales que existen en la literatura y se aportan análisis empíricos que ponen de relieve la pertinencia y la posible viabilidad de que la política monetaria preste más atención a la desigualdad, con el fin de enriquecer la evidencia a disposición de los responsables políticos. Sin perjuicio del objetivo de estabilidad de precios, sostenemos que el replanteamiento de la política monetaria ante algunos de los grandes retos de nuestro tiempo, a saber, la equidad intra e intergeneracional, debería ser considerado seriamente por académicos y responsables políticos.

Además de la política monetaria, los mercados financieros también ejercen efectos macroeconómicos que podrían limitar el deterioro de la economía real durante las recesiones y favorecer las recuperaciones. En particular, los mercados de capitales permiten el flujo de recursos financieros entre países, lo que podría proporcionar un importante efecto de distribución internacional del riesgo. Este aspecto se aborda empíricamente en el cuarto capítulo, que sugiere que, pese a la mejora registrada durante los últimos veinte años, la capacidad de los mercados de capitales de absorber fluctuaciones macroeconómicas domésticas siendo modesta en la zona euro. Desde la perspectiva de la distribución internacional del riesgo, en el contexto de la Unión de Mercados de Capitales (UMC), las iniciativas que contribuyan a fomentar la integración financiera podrían reforzar la capacidad de los países para hacer frente a las fluctuaciones macroeconómicas nacionales mediante transferencias internacionales de capital. La existencia de una "histéresis de la desigualdad" implica que el efecto macroeconómico anticíclico ejercido por los flujos de capital también tendría implicaciones positivas para la desigualdad. Sin embargo, desde una perspectiva de estabilización macroeconómica, no todos los flujos financieros son igualmente deseables. En este sentido, las implicaciones de los flujos de inversión extranjera directa (IED), normalmente impulsados por estrategias de inversión largoplacistas, podrían diferir de las de los flujos a corto plazo impulsados por estrategias de arbitraje. El capítulo 5 se centra en la regulación de la cuenta de capital y sugiere que los flujos de IED incentivados por las medidas de apertura financiera establecidas en los últimos años podrían haber aumentado la desigualdad de ingresos al favorecer en mayor medida a los trabajadores con estudios superiores, los cuales tienden a concentrarse en la parte alta de la distribución de la renta.

En resumen, esta investigación desvela hasta qué punto la política monetaria y los mercados financieros internacionales parecen haber afectado a la evolución reciente de la desigualdad de la renta en la zona euro. Más allá de las conclusiones generales mencionadas,

presentamos ahora una serie de conclusiones específicas asociadas a los distintos capítulos que componen la disertación.

A continuación, se presentan las conclusiones del primer capítulo:

- La investigación desarrollada a lo largo de este capítulo revela la importancia del ritmo y del patrón de crecimiento tanto para la equidad y como para la sostenibilidad medioambiental. A nivel nacional, esto implica identificar y aplicar políticas específicas para transitar hacia vías de crecimiento más integradoras y sostenibles, y así evitar que el crecimiento económico se produzca a expensas de los grupos de población más desfavorecidos o genere problemas medioambientales.
- Aunque el crecimiento inclusivo y sostenible requiere enfoques integrales basados en una amplia gama de políticas públicas, resulta evidente que la política monetaria tiene importantes implicaciones en la coyuntura actual. Este capítulo explora los vínculos entre la política monetaria y la desigualdad económica y los problemas medioambientales y revela que cada vez más estudios sostienen que las políticas monetarias no son neutrales para la desigualdad económica y los riesgos medioambientales.
- Más allá de los aspectos éticos sobre si la política monetaria debería tener en cuenta los retos distributivos y medioambientales en su toma de decisiones, nuestro análisis aporta numerosos argumentos a favor de que la política monetaria preste más atención a la desigualdad de ingresos y riqueza y a la degradación medioambiental y el cambio climático. Repensar la política monetaria en términos de equidad intra e intergeneracional, por lo tanto, no sólo parece necesario, sino también esencial para contribuir al cumplimiento de los ODS, y como tal debe ser considerado seriamente por los académicos y los responsables de la política monetaria.

Del segundo capítulo emanan las siguientes conclusiones:

- Esta investigación evidencia el impacto heterogéneo de la política monetaria del BCE en las distintas clases de renta de la zona euro. Si bien la visión tradicional afirma que la política monetaria es neutral o casi neutral a lo largo del ciclo económico, la literatura reciente revela que los cambios cíclicos y tendenciales casi nunca son independientes, por lo que la política monetaria podría tener efectos reales también en el largo plazo.

- Los datos utilizados en esta investigación sugieren la existencia de “efectos histéresis” en el mercado laboral tras las crisis económicas. Por un lado, en lo que respecta a la tasa de desempleo, observamos que los trabajadores situados en la parte baja de la distribución de la renta fueron tanto los primeros en salir del mercado laboral (su tasa de desempleo aumentó en 2008) como los últimos en reincorporarse al mismo durante la recuperación (el desempleo no disminuyó hasta 2017). Además, estos hogares sufrieron un aumento en su tasa de desempleo de mayor magnitud. Al examinar el ciclo económico completo, incluyendo la recuperación total hasta 2019, se observa que el deterioro cíclico sufrido desproporcionadamente por la clase baja no se revierte totalmente, ya que, durante los años posteriores a la crisis, el desempleo se mantiene por encima de las cifras anteriores, lo que provoca efectos histéresis. Por otra parte, los ingresos laborales reales mostraron un comportamiento diferente por clases de renta. En particular, el crecimiento salarial disminuyó durante la crisis y luego se estancó durante un largo período de tiempo durante la recesión. Los salarios reales se mantuvieron en torno al 5-10% por debajo de los niveles anteriores a la crisis durante siete años consecutivos y solo comenzó a recuperarse en 2016. La clase baja sufrió un deterioro más acusado y una recuperación más rezagada en comparación al resto de clases de renta. En consecuencia, el aumento en la dispersión salarial observado durante la recesión no remitió totalmente tras la fase de recuperación, y parte de ella se mantuvo hasta 2019.
- La respuesta de la tasa de desempleo a los shocks de relajación monetaria es muy desigual entre las clases de renta. En particular, la clase baja muestra una reacción de mayor magnitud y, por tanto, se beneficia de un descenso más acusado en su tasa de desempleo. La magnitud del impacto se reduce a medida que nos desplazamos hacia la parte superior de la distribución de la renta, siendo más moderado para las clases medias, mientras que la tasa de desempleo de la clase alta no parece verse afectada de forma significativa. Esto revela que la mayor actividad económica promovida por la política monetaria expansiva se materializó en más oportunidades de empleo que parecen haberse distribuido de forma desigual a lo largo de la población, favoreciendo especialmente a los hogares más vulnerables. Por esta vía, durante el pasado ciclo económico, la relajación monetaria parece haber contribuido a contener la desigualdad de ingresos a través del margen extensivo (es decir, las oportunidades de empleo) del mercado laboral. Este efecto parece haber sido especialmente importante en el caso de Irlanda, Luxemburgo y España, mientras que ha sido más moderado en Finlandia,

Alemania y los Países Bajos. Las diferencias entre países parecen estar relacionadas con la sensibilidad de la tasa de empleo al ciclo económico.

- La respuesta de las rentas del trabajo a los shocks de relajación monetaria también difiere según las clases de renta. El análisis pone de relieve que las rentas del trabajo obtenidas por la clase baja no se han visto afectadas significativamente por la política monetaria expansiva. Por su parte, el salario de las clases medias sí parecen haber obtenido un efecto positivo, si bien el impacto es bastante moderado y aparece con un desfase de entre ocho y doce trimestres. Esto contrasta con la dinámica mostrada por la clase alta, para la que el impacto es mayor y se materializa antes en el tiempo (entre tres y ocho trimestres después del shock). Esto sugiere que la flexibilización monetaria podría haber exacerbado la desigualdad de ingresos a través del margen intensivo (es decir, los salarios), ya que las clases de ingresos más altos disfrutaron de mayores efectos positivos, mientras que los salarios devengados por los hogares de bajos ingresos han sido bastante insensibles a las perturbaciones expansivas. En este sentido, el impacto ha sido mayor para las clases altas de Francia, Irlanda, Italia, Luxemburgo y España.
- Este análisis pone de relieve que la política monetaria expansiva parece haber reducido la desigualdad de ingresos a través del margen extensivo (es decir, la tasa de desempleo) del mercado laboral, mientras que ha aumentado las disparidades entre las clases de ingresos a través del margen intensivo (es decir, los salarios). Al examinar el impacto total, observamos que predomina ampliamente el efecto reductor de la desigualdad del margen extensivo. En un segundo análisis, esta investigación trata de entender hasta qué punto este efecto de disminución de la desigualdad se debe a la reacción de la tasa de separación del empleo (es decir, las personas empleadas tienen menos probabilidades de perder su empleo) o más bien está relacionado con la tasa de búsqueda de empleo (es decir, las personas desempleadas tienen más probabilidades de encontrar un empleo). Este análisis confirma que la situación laboral de los trabajadores más pobres es sustancialmente más elástica a las perturbaciones políticas, y que el impacto diferencial entre clases de renta se debe en gran medida a una mejora de las tasas de búsqueda de empleo para aquellos que se sitúan en la parte inferior de la distribución de la renta. Por el contrario, el impacto positivo de la relajación monetaria sobre las tasas de separación del empleo ha sido bastante homogéneo en toda la distribución.

- Esta investigación concluye que la política monetaria expansiva ha contribuido a reducir la desigualdad de las rentas del trabajo, ya que el impacto positivo a través del margen extensivo (es decir, la mejora de las oportunidades laborales de los más vulnerables) ha compensado en gran medida el aumento de la desigualdad impulsado por el margen intensivo (es decir, la mejora de los salarios percibidos por los hogares más acomodados). Esencialmente, observando la situación del empleo, un shock de relajación monetaria parece apoyar especialmente el empleo de quienes se encuentran en la parte inferior de la distribución de la renta. En cuanto a los salarios reales, aquellos percibidos por los hogares más vulnerables no verse afectados, mientras que los de la clase alta sí aumentan tras un impacto expansivo de política monetaria. Aunque estas conclusiones se mantienen cualitativamente para todos los países que componen la muestra, los análisis realizados ponen de manifiesto diferencias significativas entre países. En particular, los países en los que la tasa de desempleo y los salarios reales fluctuaron más durante el ciclo económico son aquellos para los que se estiman los mayores impactos (véase, por ejemplo, Irlanda, Luxemburgo, España y Portugal). Los aspectos relacionados con la flexibilidad del mercado laboral también determinan la reacción de los salarios a la política monetaria anticíclica.

Las conclusiones principales del tercer capítulo son las siguientes:

- En el tercer capítulo, la observación de los indicadores de movilidad de los ingresos derivados de los datos de la Estadística de la Unión Europea sobre Ingresos y Condiciones de Vida (EU-SILC) muestra que las cifras de movilidad ascendente y descendente no son uniformes en todos los países que componen la muestra. La dispersión es mayor en el caso de las tasas de movilidad descendente, que en algunos países son 3,5 veces superiores a las de otros países en el mismo año. Las razones que explican estas disparidades incluyen las características estructurales e institucionales que prevalecen en cada país.
- Durante el periodo estudiado (2004-2015), los datos revelan una disminución de la movilidad tanto ascendente como descendente en casi todos los países, lo que apunta hacia una preservación cada vez mayor del statu quo. Este parece ser el caso de todos los países, a excepción de Portugal y Luxemburgo. En Portugal, tanto la movilidad ascendente como la descendente presentan un cambio estructural en torno a 2008-2009, cuando se estabilizaron en torno a niveles muy superiores a los existentes antes de la CFG. En el caso de Luxemburgo, ambas movilidades oscilaron más bien

horizontalmente durante la mayor parte de los años, pero luego experimentaron un fuerte aumento interanual entre 2014 y 2015.

- Considerando el conjunto de la población, observamos que un choque negativo (expansivo) de los tipos de interés reales a largo plazo parece favorecer la movilidad ascendente (porcentaje de la población que experimenta movimientos de dos o más deciles hacia arriba) y desalentar la movilidad descendente (porcentaje de la población que experimenta movimientos de dos o más deciles hacia abajo).
- Los resultados específicos para cada una de las clases de renta muestran que el impacto de la política monetaria del BCE sobre la movilidad de la renta difiere para las distintas clases socioeconómicas. Para la parte baja de la distribución de la renta, los resultados no son estadísticamente significativos, lo que sugiere que la política monetaria podría no haber tenido un impacto significativo en la movilidad ascendente de la clase baja. Esto podría sugerir que los beneficios obtenidos por los individuos en la parte inferior de la renta podrían únicamente permitirles preservar su posición relativa, sin generar un ascenso significativo en la escala de ingresos.
- En cuanto a las clases medias, la política monetaria parece haber sido especialmente favorable, ya que los choques expansivos parecen haber impulsado la movilidad ascendente. Un análisis detallado de la clase media muestra que la política monetaria expansiva parece favorecer especialmente a la clase media-baja, impulsando la movilidad ascendente y obstaculizando la movilidad descendente. Sin embargo, los resultados para la clase media-alta no parecen ser estadísticamente significativos.
- En el caso de la clase alta, la relajación monetaria parece disminuir su movilidad descendente. Esta reducción de la movilidad descendente de la clase alta es coherente con la literatura que sugiere que la política no convencional parece aumentar las rentas del capital de los ricos.

Las conclusiones del capítulo cuarto incluyen:

- En el cuarto capítulo, la observación de los datos sugiere que la contribución de los mercados de capitales a la distribución internacional del riesgo en la zona euro es modesta, sobre todo en comparación con una unión monetaria establecida desde hace tiempo como la de Estados Unidos (EE.UU.). A pesar de la mejora que siguió a la creación de la Unión Monetaria Europea (UME), la cual impulsó la inversión transfronteriza y contribuyó a una mayor diversificación internacional de la propiedad, los mercados de capitales sólo han permitido suavizar en torno al 5-10%

de las fluctuaciones domésticas del producto interior bruto (PIB) en las dos últimas décadas. Esto contrasta fuertemente con Estados Unidos, donde la contribución del canal de capital a la compartición internacional de riesgos ha sido entre tres y cinco veces mayor.

- Los resultados indican que el canal del crédito ha sido históricamente el mecanismo de compartición internacional de riesgo más importante en la zona euro, si bien se vio temporalmente afectado durante la crisis financiera mundial y la posterior crisis de la deuda soberana. Durante este período, las perspectivas crediticias de los países más afectados se deterioraron y los mercados financieros se endurecieron, perjudicando la distribución del riesgo a través del canal del crédito.
- Los análisis permiten identificar la contribución de los flujos de capital intrarregionales (es decir, los flujos netos de renta de los factores entre países pertenecientes a la misma región) y los flujos interregionales (es decir, los flujos netos de renta de los factores entre países pertenecientes a regiones diferentes). En los países del sur, la mejora de la distribución del riesgo a través del capital internacional durante el período 2000-2012 se debió principalmente a los flujos interregionales. Sin embargo, desde la CFG, el canal de capital interregional ha disminuido notablemente, llegando incluso a ser negativo durante los últimos diez años, ejerciendo un efecto desalisador y exacerbando, en lugar de suavizar, las fluctuaciones domésticas del PIB. Este colapso parece estar relacionado con la fuerte disminución de los pasivos transfronterizos interregionales sufrida por los países del Sur. En los últimos años, la contribución intrarregional ha seguido una tendencia al alza, pero sólo ha podido compensar la contribución negativa de los flujos interregionales. Como resultado, se estima que el efecto total del canal de capital en la distribución del riesgo en los países del sur es prácticamente nulo. Esto contrasta fuertemente con la situación de los países del norte, donde el colapso de la distribución interregional del riesgo durante la recesión fue menos pronunciado, y las mayores contribuciones de los flujos intrarregionales permitieron al canal de capital suavizar alrededor del 6% de las perturbaciones idiosincrásicas del PIB en los últimos años de nuestra muestra.
- Utilizando datos de la Encuesta Coordinada de Inversiones de Cartera del Fondo Monetario Internacional (FMI), se analiza asimismo la composición de las carteras transfronterizas. En este sentido, la investigación concluye que las fluctuaciones de los pagos de intereses relacionados con los activos y pasivos de deuda a largo plazo, así como los pagos de dividendos derivados de los pasivos de renta variable, han

proporcionado un importante efecto positivo a la compartición de riesgos. Sin embargo, y en consonancia con el tamaño relativo de estas carteras, esta contribución ha sido mucho mayor en el caso de los países del norte en comparación con el sur. Curiosamente, a pesar de que los pasivos de renta variable sólo representan una pequeña parte del total de pasivos transfronterizos para ambas regiones (17% y 9% para los países del norte y del sur, respectivamente), estos instrumentos están asociados a un efecto adicional de distribución del riesgo similar cuando se comparan con los pasivos de deuda a largo plazo (79% y 85%, respectivamente).

- Los datos de la Encuesta Coordinada de Inversión Directa del FMI nos permiten analizar el papel de la inversión extranjera directa (IED). En este sentido, esta investigación pone de relieve que las entradas de capital desempeñaron un papel importante en la distribución del riesgo en los países del norte, mientras que el efecto parece ser insignificante en el sur. La explicación radica en la magnitud relativa de los flujos de IED. En particular, la inversión entrante hacia los países del norte (en % del PIB) fue más de seis veces superior a la recibida por los países del sur.
- Esta investigación tiene importantes implicaciones para el debate político, ya que pone de relieve la necesidad de una mayor integración de los mercados financieros de la zona euro y la relevancia de la Unión de Mercados de Capitales (UMC). Los resultados muestran que la capacidad de distribución del riesgo de los flujos de capital continúa siendo modesta. Según esta investigación, una mayor integración financiera que impulse la tenencia de instrumentos de capital internacional podría ser especialmente beneficiosa desde la perspectiva de la compartición internacional del riesgo.

En el capítulo quinto se presentan las siguientes conclusiones finales:

- Este análisis de la relación entre la liberalización de la cuenta de capital y la distribución de la renta pone de relieve que la apertura de la IED parece haber beneficiado a todas las clases de renta. A pesar de que el efecto es positivo para toda la población, su magnitud difiere, siendo los efectos de la apertura de la IED sobre la renta heterogéneos a lo largo de los distintos hogares, beneficiando en mayor medida a la clase alta. La magnitud del impacto se reduce progresivamente a medida que nos desplazamos hacia la parte inferior de la distribución de la renta, lo que conduce a un impacto general de aumento de la desigualdad.
- La hipótesis de la complementariedad entre capital y cualificación puesta a prueba a lo largo de la investigación sugiere que la liberalización de los flujos de IED en las

economías avanzadas podría beneficiar especialmente a los trabajadores nacionales altamente cualificados, ya que (i) es más probable que sean complementarios del capital entrante y (ii) es menos probable que se vean afectados por las salidas de IED que buscan externalizar procesos intensivos en mano de obra a países emergentes con salarios más bajos. Los resultados validan esta hipótesis, ya que ponen de manifiesto el papel clave que desempeña el nivel educativo en la configuración de la relación entre la apertura de la IED y la participación de los individuos en la renta. En particular, los hogares que cuentan con un mayor porcentaje de individuos con un alto nivel educativo se benefician más de dicha apertura que los hogares con un nivel educativo inferior. Esto implica un aumento desproporcionado de la participación en la renta nacional de la clase alta, ya que los individuos con un alto nivel educativo no se distribuyen aleatoriamente entre la población, sino que tienden a estar sobrerrepresentados en la parte alta de la distribución.

- Los resultados sugieren que la liberalización de la cuenta de capital que afecta a los flujos de IED podría haber aumentado la desigualdad de ingresos mediante el canal de la hipótesis de complementariedad capital-cualificación, siendo este efecto persistente para todos los años de la muestra (entre 2007 y 2013). El hecho de que este efecto distributivo persista a lo largo de los años examinados, independientemente del entorno económico (antes, durante, y después de la crisis) podría deberse, en parte, a que la distribución de las personas con un alto nivel educativo no es sensible al ciclo económico.
- Este estudio tiene importantes implicaciones desde el punto de vista político. Los resultados revelan que la distribución de la educación, como fuente significativa de desigualdad de oportunidades, constituye un elemento central a la hora de examinar los vínculos entre la liberalización financiera de los flujos de IED y la desigualdad de ingresos. Por lo tanto, más allá de las decisiones políticas sobre el grado de liberalización de la cuenta de capital, un sistema que contribuya a crear un terreno de juego más nivelado para todos los miembros de la sociedad podría considerarse una intervención pública clave capaz de configurar la relación entre la apertura de la IED y la desigualdad de ingresos entre las clases de renta.

II. Limitaciones y futuras líneas de investigación

Las limitaciones asociadas al capítulo primero son:

- La literatura revisada durante esta investigación se produjo durante los años de la "Gran Moderación" y, posteriormente, en el contexto del entorno de bajos tipos de interés en Europa. En la coyuntura actual de inflación sostenida por encima del objetivo fijado por los bancos centrales, los vínculos potenciales entre la política monetaria y tanto la desigualdad de la riqueza y la renta como las preocupaciones medioambientales podrían diferir de los hallados con anterioridad.
- Las investigaciones centradas en la relación entre el cambio climático y la política monetaria que se han realizado hasta la fecha son, en su mayoría, de carácter cualitativo debido a la escasez de datos existentes. Sin embargo, cada vez son más las bases de datos disponibles. A este respecto, entre otras iniciativas, el BCE publicó en enero de 2023 por primera vez un conjunto de indicadores estadísticos relacionados con el clima, que abarcan las finanzas sostenibles, las emisiones de carbono y los riesgos físicos, lo que podría contribuir a reforzar la evidencia empírica en este ámbito.

Respecto al capítulo segundo, las limitaciones incluyen:

- Los mecanismos de transmisión a través de los cuales la política monetaria puede afectar a la desigualdad son abundantes, como se detalla a lo largo del primer capítulo. Esta compleja dinámica puede dividirse en canales específicos que afectan tanto a la distribución de la renta como a la de la riqueza. En este sentido, este documento se centra en la distribución de la renta y, dentro de ella, en los canales que operan a través del mercado de trabajo (es decir, los canales de composición de la renta y de heterogeneidad de los ingresos). Al centrarnos en la desigualdad de la renta del trabajo, dejamos fuera de nuestro análisis otras áreas que merecen ser exploradas. Futuras investigaciones complementarias podrían considerar, por un lado, los posibles efectos distributivos de la política monetaria que operan a través de la renta no laboral, tales como las ganancias financieras y los beneficios empresariales.
- El concepto de renta utilizado es el de renta de mercado (es decir, antes de transferencias e impuestos). Esta definición incluye todas las rentas del trabajo (salarios de los asalariados y rentas de los trabajadores autónomos), las rentas del capital y de la propiedad, las transferencias entre hogares, así como las rentas de los

planes de pensiones privados. Esta investigación se centra en los hogares que participan activamente en el mercado laboral, para los que la renta de mercado en toda la muestra es superior a cero. A este respecto, futuras investigaciones podrían adoptar una visión más amplia y explorar el impacto de la política monetaria del BCE sobre las distintas clases de renta, incluidos los hogares que no perciben salarios, sino que obtienen sus ingresos íntegramente de otras fuentes (por ejemplo, los pensionistas y los hogares puramente capitalistas), así como analizar la interacción entre la política monetaria y la política fiscal.

- El análisis proporciona estimaciones del impacto específico de las perturbaciones de la política monetaria para cada clase socioeconómica. Para ello, los hogares se clasifican por clase de renta en función de su distancia respecto a la renta mediana disponible. De este modo, distinguimos entre las clases baja, media-baja, media-alta y alta. Datos recientes sobre Dinamarca (véase Andersen et al., 2023) revelan heterogeneidad en la respuesta de los ingresos laborales dentro de la clase baja. En este sentido, investigaciones futuras podrían desagregar aún más este segmento de la población para proporcionar un análisis más profundo de la transmisión de la política monetaria a lo largo de la clase baja.
- La dimensión temporal de este análisis abarca el periodo de recesión y la posterior recuperación antes de la crisis de COVID-19. A lo largo de este periodo, el Banco Central Europeo aplicó instrumentos de política monetaria convencionales y no convencionales para apoyar la economía. El objetivo de este trabajo es captar el impacto conjunto de todas las medidas aplicadas durante estos años para ofrecer una visión holística de sus implicaciones distributivas, de forma agregada. Los resultados de esta investigación podrían complementarse con análisis adicionales que traten de detallar si los distintos tipos de política monetaria han ejercido un impacto heterogéneo sobre la desigualdad de las rentas del trabajo.

Las limitaciones del tercer capítulo se presentan a continuación:

- La base de datos de EU-SILC tiene la ventaja de recoger información detallada sobre la renta individual y familiar, siendo los datos comparables entre los países europeos participantes. Sin embargo, el componente longitudinal sólo sigue a los individuos durante cuatro oleadas consecutivas, lo que implica que cada año el 25% de la muestra se sustituye por un nuevo grupo rotatorio. Dado que las medidas de movilidad se basan en las variaciones de los ingresos durante dos años consecutivos,

los resultados identificados podrían ser más imprecisos que aquellos estimados con otras medidas basadas en secuencias más largas de datos de panel.

- Como en el caso del segundo capítulo, el concepto de renta utilizado es el de renta de mercado de los hogares (es decir, antes de transferencias e impuestos). Esta definición incluye todas las rentas del trabajo (salarios de los asalariados y rentas de los trabajadores autónomos), las rentas del capital y de la propiedad, las transferencias entre hogares, así como las rentas de los planes de pensiones privados. Sin embargo, no todas las fuentes de ingresos tienen la misma importancia para las distintas clases de renta: mientras que los ingresos de mercado acumulados por las clases de renta baja y media-baja proceden principalmente de los salarios, las clases altas tienden a obtener una mayor proporción de sus ingresos de las rentas del capital. En este sentido, futuras investigaciones podrían explorar cómo el impacto de la política monetaria del BCE sobre la movilidad de la renta viene determinado por sus efectos sobre las distintas fuentes de renta.
- La movilidad se define en términos relativos y los cambios en la posición relativa de los individuos se miden mediante matrices de transición. La matriz de transición se construye dividiendo primero el rango de ingresos de cada distribución marginal en deciles (es decir, diez categorías) y tabulando de forma cruzada la frecuencia relativa de las observaciones dentro de cada celda de la matriz. Este enfoque permite estimar por separado el porcentaje de individuos que descienden en la escala y el de los que ascienden. Sin embargo, este enfoque tiene el inconveniente de que se pierde información tanto sobre los cambios que se producen dentro de un mismo decil como sobre la magnitud de la variación de ingresos que supone el cambio de decil. Otras investigaciones complementarias podrían tratar de solventar estas limitaciones.
- Los archivos longitudinales de EU-SILC no proporcionan información sobre Alemania, por lo que en futuros análisis podría estudiarse en qué medida otras bases de datos nacionales específicas contienen información que permita replicar el análisis para este país.

El capítulo cuatro hace frente a las siguientes limitaciones:

- La literatura en la que se enmarca esta aportación mide la distribución del riesgo como el porcentaje del total de las fluctuaciones (idiosincrásicas) del crecimiento del PIB específicas de cada país (es decir, el componente "diversificable" del riesgo) que se suaviza a través de los flujos financieros que representan cada uno de los canales (por

ejemplo, la renta neta de los factores representa el canal del capital). En este sentido, la definición de riesgo diversificable depende siempre de los países de referencia y, por consiguiente, los resultados deben interpretarse con cautela, ya que sólo miden la distribución del riesgo entre los países incluidos en cada muestra específica. Futuras investigaciones podrían abordar una revisión sistemática del reparto del riesgo y su evolución a través de diferentes muestras, complementando así nuestra contribución al considerar, por ejemplo, todos los países de la zona del euro, la Unión Europea y el mundo entero.

- El análisis de la composición de las carteras transfronterizas se basa en los datos del FMI. Estos datos recogen flujos bilaterales y podrían ofrecer una visión sesgada de las vinculaciones de cartera entre los países de nuestra muestra debido a la actividad financiera que tiene lugar a través de los centros financieros extraterritoriales de la zona euro (a saber, Irlanda, Luxemburgo y los Países Bajos), donde residen la mayoría de los fondos de inversión europeos. Como ejemplo de este sesgo, los vínculos bilaterales "indirectos" o "intermediados", tales como las acciones de empresas alemanas en manos de un fondo de inversión con sede en los Países Bajos, se interpretan como flujos bilaterales entre este país y Alemania, por lo que no se tiene en cuenta la residencia del propietario último de las acciones. Esta investigación se abstiene deliberadamente de contabilizar tales vínculos, ya que la literatura anterior ha revelado la existencia de complejas dificultades relacionadas sobre todo con la falta de datos granulares y comparables entre países, así como con el amplio conjunto de supuestos que habría que adoptar para proporcionar estimaciones bilaterales de tales vínculos "indirectos". Otros análisis podrían aprovechar los crecientes esfuerzos para producir estimaciones nacionales, como Felettigh y Monti (2008) y Della Corte et. Al (2018) para el caso de Italia.
- En esta literatura, la evolución del reparto del riesgo suele estimarse mediante dos técnicas. Por un lado, algunos autores emplean modelos estáticos mediante regresiones aparentemente no relacionadas (SUR), estimadas para cada período por separado, explotando así únicamente la dimensión transversal de los datos. Por otro lado, otros autores prefieren el análisis de series temporales y utilizan modelos vectoriales autorregresivos (VAR), realizando estimaciones secuenciales sobre submuestras limitadas con distintas ventanas temporales. A diferencia del SUR, el enfoque VAR tiene en cuenta la endogeneidad existente entre los distintos canales. Sin embargo, esta metodología no está exenta de costes, y conlleva algunos inconvenientes

relacionados con la precisión temporal. En particular, el uso de la metodología VAR implica que una estimación concreta no puede atribuirse a un periodo exacto, ya que resulta de un modelo que incluye datos a lo largo de cierto periodo de tiempo. En consecuencia, la última estimación proporcionada por nuestro enfoque de ventana móvil emana de la muestra entre 2012T2 y 2021T1, y por lo tanto no proporciona una visión actual y precisa sobre, por ejemplo, la distribución del riesgo durante el período COVID-19.

- La mejor alternativa para estimar la contribución de los distintos instrumentos al reparto de riesgos a través de los mercados de capitales sería desagregar los flujos de capital derivados por cada uno de los instrumentos. Sin embargo, debido a la falta de datos de *flujos*, tenemos que trabajar con los datos de *stock* de los distintos instrumentos. Con el fin de proporcionar una idea sobre la medida en que los diferentes instrumentos han contribuido a las fluctuaciones en la capacidad de distribución del riesgo proporcionado por los mercados de capitales, empleamos un VAR de umbral. En concreto, para cada uno de los instrumentos considerados en nuestros análisis, utilizamos su magnitud (en % del PIB) para definir, para cada uno de los países analizados, dos regímenes: un régimen en el que la tenencia relativa de ese instrumento se considera "alta" y un régimen en el que esta métrica se considera "baja". El nivel del umbral se calcula de forma endógena siguiendo la metodología de Hansen (1999), que prueba simultáneamente la existencia de un efecto umbral y detecta el nivel de la variable umbral. El umbral óptimo es aquel que minimiza la suma de errores al cuadrado tras una prueba de razón de verosimilitud. Por consiguiente, nuestros resultados reflejan la contribución adicional del canal del capital durante el régimen de "alta" magnitud (*stock* elevado) en comparación con el régimen de "baja" magnitud (*stock* inferior). La disponibilidad de flujos financieros específicos para cada instrumento podría permitir un análisis más preciso. Asimismo, futuras investigaciones podrían estudiar los factores más importantes que explican la diferencia entre la capacidad potencial y real de distribución del riesgo, incluidas las diferencias entre países.

Las limitaciones asociadas al capítulo cinco son las siguientes:

- Esta investigación se centra en el examen de la hipótesis de la complementariedad entre el capital y la cualificación laboral como canal crucial que vincula la liberalización financiera y la desigualdad de ingresos. Para ello, el análisis se limita a

las medidas de apertura de la IED, basándose en la observación de que los flujos de IED tienden a seguir estrategias de inversión largoplacistas y buscar un desarrollo bastante duradero del entorno empresarial nacional. En este sentido, estos flujos han demostrado ser clave para la formación de capital, las transferencias de conocimientos y, por tanto, la productividad y el crecimiento en los países receptores. En esta línea, excluimos de nuestro análisis otros tipos de flujos financieros que, en nuestra opinión, obedecen a otras estrategias más volátiles. Por ejemplo, los flujos de deuda podrían responder a intenciones de inversión a corto plazo y, por tanto, ser propensos a comportarse de forma procíclica. Las investigaciones futuras podrían centrarse en este último caso e investigar otros canales, tales como las posibles consecuencias distributivas a través del impacto sobre la estabilidad financiera. En general, los instrumentos y mecanismos a través de los cuales la liberalización de los flujos de capital puede afectar a la distribución de la renta son numerosos, y más investigación es necesaria para ahondar en otros posibles canales.

- Los vínculos entre la liberalización del capital y la desigualdad de ingresos son eminentemente contextuales y dependen de situaciones y circunstancias específicas. Por consiguiente, las conclusiones de esta investigación no deben generalizarse, pues lejos de derivar resultados que se mantengan bajo cualquier condición, la literatura pretende identificar efectos contingentes. Esto sería particularmente visible si el estudio se replicara en un área económica diferente, por ejemplo, en países emergentes, donde la importancia de otros mecanismos, tales como las implicaciones de la liberalización de los flujos de capital en términos de acumulación de reservas financieras internacionales por parte de los bancos centrales y sus consecuencias, probablemente serían más relevantes. Al mismo tiempo, el papel que juega el nivel educativo también debe explorarse en cada contexto particular.
- En primer lugar, el documento se centra esencialmente en el examen de la hipótesis de la complementariedad entre el capital y el nivel educativo como canal crucial en el contexto europeo, si bien son muchos los mecanismos a través de los cuales la liberalización de los flujos de capital puede afectar a la distribución de la renta. Por lo tanto, se necesitaría más investigación para ahondar en otros posibles canales.
- En segundo lugar, los distintos tipos de flujos financieros están respaldados por estrategias heterogéneas y tienen implicaciones distributivas diferentes. En este sentido, los flujos de deuda pueden estar al servicio de intenciones de inversión a corto plazo y, por tanto, ser propensos a graves retrocesos durante las recesiones, mientras

que la inversión extranjera directa puede buscar un desarrollo más bien duradero del entorno empresarial nacional.

- En tercer lugar, como medida de la liberalización de los flujos de capital, el estudio utiliza el índice de liberalización de jure de la cuenta de capital, publicado anualmente por el FMI, basado en la normativa que aplican los países, que se centra en la apertura de la cuenta de capital con respecto a la categoría específica de activos de IED. No obstante, se dejan de lado los flujos de capital a más corto plazo, como los activos del mercado monetario y los derivados, que son más propensos a estar impulsados por estrategias de arbitraje y, por término medio, están menos asociados a los objetivos de la economía real que la IED. Por último, nuestro enfoque de examinar los impactos distributivos teniendo en cuenta la situación de cada individuo dentro de la distribución de la renta se basa en una definición relativa de las clases de renta que emplea umbrales de renta convencionalmente aceptados. Aunque se han realizado pruebas sólidas pertinentes utilizando definiciones alternativas de las clases de renta, también podría resultar enriquecedor un análisis más amplio de enfoques alternativos para determinar las clases socioeconómicas.

Futuras investigaciones podrían abordar los siguientes aspectos:

- A lo largo de la primera parte de la tesis, los tres primeros capítulos analizan la literatura existente y aportan evidencia empírica sobre el impacto potencial de la política monetaria expansiva en la desigualdad de ingresos. Para ello, los análisis se centran en el período comprendido entre la Crisis Financiera Global y el estallido de la pandemia del COVID-19. En este período, los tipos de interés oficiales disminuyeron hasta situarse en terreno negativo, y las herramientas de política monetaria no convencional trataron de reforzar la transmisión de la orientación monetaria expansiva. Tras la pandemia, la aparición de una inflación superior al objetivo de política monetaria ha desencadenado un cambio en la estrategia del Banco Central Europeo, que ha venido aumentando sus tipos desde mediados de 2022. En este sentido, las implicaciones de las políticas monetarias contractivas no son necesariamente la reversión de las asociadas a los periodos expansivos, por lo que deben analizarse de forma específica. Esta futura línea de investigación es clave para producir la evidencia empírica necesaria para guiar la formulación de la política monetaria a lo largo de futuros ciclos de ajuste presentes y futuros. Además, estudios recientes como el de Moawad y Oesch (2023) sugieren que los principales perdedores

económicos en las últimas décadas no han sido la clase baja ni las clases medias en su totalidad, sino más bien la clase trabajadora, definida por la ocupación en lugar de por los niveles de ingresos. En una dirección similar, evidencia reciente (véase, por ejemplo, Andersen et al., 2023) descubre heterogeneidad en la respuesta del ingreso laboral a los impulsos de política monetaria dentro de la clase baja. La investigación futura podría abordar un desglose más detallado de los grupos, así como una redefinición de las clases basada en indicadores relacionados con la ocupación. Además, la consideración de factores adicionales tales como la edad, la raza, y el nivel educativo, podrían contribuir a vislumbrar cómo los diferentes individuos son afectados de manera única por las políticas monetarias.

- En la segunda parte de la tesis, los capítulos cuarto y quinto se centran en los mercados de capitales y analizan sus implicaciones heterogéneas para las distintas clases de renta. Este ejercicio se desarrolla tanto desde una perspectiva macroeconómica, abordando el tema de la compartición internacional del riesgo, como desde una perspectiva microeconómica, analizando el impacto de las entradas y salidas de IED en las distintas clases de renta. Estas investigaciones dejan fuera las posibles implicaciones de otros tipos de flujos financieros que también deberían tomarse en consideración, a saber, los flujos de crédito a través del crédito bancario transfronterizo y los flujos de capital a través de inversiones de cartera.



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