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## **Essays on Banking and Society**

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À mes proches.

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#### **Résumé Long**

Le secteur bancaire et la société sont étroitement liés. L'intermédiation financière assurée par les banques a soutenu le développement de la société en permettant la circulation de l'argent, le financement des entreprises, et l'investissement de l'épargne. Par ce biais, les activités bancaires contribuent au développement de la société en améliorant le bien-être des individus grâce à une réallocation efficace des ressources financières. Toutefois, la priorité accordée par les banques à la maximisation du profit plutôt qu'au bien-être social a engendré une prise de risque excessive, fragilisant la stabilité financière et provoquant des crises économiques. Ce désalignement des intérêts entre les banques et la société a érodé la confiance du public à l'égard du secteur bancaire. Dans ce contexte, il devient crucial de veiller à ce que les pratiques bancaires soient davantage alignées sur les valeurs et les objectifs de la société, afin que le secteur bancaire puisse contribuer positivement à son développement. À cet égard, la société elle-même peut influer sur ces pratiques en incitant les banques à adopter des objectifs davantage centrés sur l'intérêt général. Compte tenu du rôle majeur des ressources financières pour le développement de la société, l'étude de l'interaction entre le secteur bancaire et la société s'avère essentielle pour relever les enjeux contemporains et améliorer le bien-être général des individus. Cette thèse propose donc d'examiner cette relation réciproque entre les banques et la société en abordant une question centrale : comment les banques peuvent-elles contribuer au développement de la société et inversement, comment la société peut-elle façonner les pratiques bancaires ?

Visant à approfondir la littérature sur l'interaction entre les banques et la société, cette thèse explorera successivement plusieurs enjeux sociétaux majeurs dans le secteur bancaire : la confiance dans les banques, l'inclusion financière et l'accès au crédit. Cette thèse abordera ces questions en contribuant à deux volets de la littérature. Premièrement, cette thèse vise à approfondir la littérature sur les conséquences sociales et sociétales des pratiques bancaires. Aborder ce sujet peut permettre aux décideurs politiques de mettre en œuvre des réglementations favorisant les activités bancaires contribuant à résoudre les problèmes sociaux et sociétaux. Le second objectif de cette thèse est d'accroître la littérature sur les déterminants sociaux et sociétaux des pratiques bancaires. Comprendre comment l'allocation des services bancaires est influencée par la société peut guider les décideurs politiques dans la mise en place de législations favorisant un développement financier conforme aux intérêts de la société. Ce

travail examinera l'interaction entre les banques et la société dans cinq essais empiriques indépendants mais thématiquement liés.

Tout d'abord, cette thèse examine les conséquences des activités bancaires sur la société. Les banques ne peuvent promouvoir le développement sociétal que si les individus sont enclins à utiliser les services financiers. La confiance dans les banques est donc essentielle pour encourager les individus à recourir à ces services. Il convient ainsi d'en comprendre les déterminants afin d'identifier quels facteurs peuvent la détériorer ou au contraire, la préserver. Le premier chapitre s'intéresse à l'effet de l'inflation sur la confiance dans les banques des individus. En exploitant les données de questionnaires transnationaux comprenant 143 000 observations dans 72 pays, il montre que l'inflation vécue, qu'elle soit récente ou expérimentée tout au long de la vie, nuit à la confiance actuelle dans les banques. Cela suggère que l'inflation exerce un effet à la fois à court et à long terme sur la confiance dans les banques, indiquant que la confiance dans les banques est fragile et peut être difficile à rétablir. Certaines caractéristiques individuelles telles que l'éducation et l'accès à l'information peuvent modérer l'impact négatif de l'inflation sur la confiance dans les banques.

Si la confiance dans les banques peut être affectée par des chocs économiques, le deuxième chapitre met en évidence l'importance de la préserver pour favoriser l'inclusion financière des individus. À partir de données microéconomiques regroupant environ 61 000 observations de 28 pays, il constate que les individus faisant confiance aux banques sont plus susceptibles d'être inclus financièrement. De plus, cet effet positif de la confiance dans les banques sur l'inclusion financière est universel : il affecte tous les individus, indépendamment de leurs caractéristiques sociodémographiques et de leur situation financière, et ne varie pas en fonction du pays ou de l'année. Ce chapitre souligne donc l'importance de la confiance dans les banques pour renforcer l'inclusion financière des individus.

Dès lors, comment l'inclusion financière peut-elle promouvoir le bien-être social et individuel ? Le chapitre 3 tente de répondre à cette question en examinant l'effet de l'inclusion financière sur la satisfaction dans la vie des individus. Les résultats montrent que l'inclusion financière améliore la satisfaction dans la vie des individus, notamment via de meilleures conditions de santé, d'éducation et, dans une moindre mesure, la création d'entreprises. En outre, l'effet positif de l'inclusion financière est plus important dans les pays ayant un PIB par habitant plus élevé et plus faible dans les pays récemment frappés par une crise financière. Il apparaît donc que les activités bancaires favorisent également le développement sociétal au niveau microéconomique en augmentant le bonheur des individus.

Si les banques peuvent promouvoir le développement social et le bien-être en assurant l'inclusion financière des individus, elles peuvent également contribuer à un développement social plus équitable et durable en mettant en œuvre des pratiques inclusives. Les quatrième et cinquième chapitres explorent précisément l'influence des caractéristiques sociales des dirigeants bancaires sur leurs politiques de prêt, afin de montrer dans quelle mesure la société peut façonner les activités bancaires. Le quatrième chapitre étudie l'effet du genre des dirigeants de banque sur l'accès au crédit des entreprises. À l'aide d'une large base combinant des données au niveau des entreprises et des banques, il montre qu'une présence plus importante de femmes dans la direction des banques conduit globalement à une réduction de la dette bancaire à des entreprises, conformément à l'idée que les femmes sont plus averses au risque que les hommes. De plus, cet effet dépend de la maturité de la dette : des instances de dirigeance plus féminines contribuent à réduire la dette bancaire à long terme, mais à augmenter la dette bancaire à court terme. En outre, une plus grande proportion de femmes parmi les dirigeants de banques n'exerce d'effet négatif que pour les entreprises dirigées par des hommes. Ce chapitre suggère que le secteur bancaire peut contribuer à réduire les inégalités de financement entre les hommes et les femmes en mettant en œuvre des politiques plus inclusives.

Alors que les normes de genre affectent les pratiques bancaires, le dernier chapitre met en évidence l'effet de l'âge sur les pratiques bancaires. Le dernier chapitre examine en particulier l'influence de l'âge des dirigeants des banques sur l'octroi de prêts durables. Les prêts durables sont plus susceptibles d'être accordés par des banques dont les dirigeants sont plus jeunes. Ce résultat est cohérent avec l'idée selon laquelle les jeunes sont plus sensibles aux enjeux de durabilité. Cet effet est également générationnel : un prêt durable a plus de chances d'être accordé par une banque comptant une plus grande proportion de milléniaux, alors que l'inverse est vrai pour la génération silencieuse. Par ailleurs, ce sont principalement les plus jeunes dirigeants, plutôt que les plus âgés, qui encouragent l'octroi de prêts durables. Ce chapitre suggère donc qu'un changement générationnel pourrait amener les banques à promouvoir le développement durable.

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## List of Abbreviations and Acronyms

APLMA	Asia Pacific Loan Market Association		
CEO	Chief Executive Officer		
CSRD	Corporate Sustainability Reporting Directive		
EBRD	European Bank for Reconstruction and Development		
ESG	Environmental, Social and Governance		
FE	Fixed Effects		
GDP	Gross Domestic Product		
GLP	Green Loan Principles		
IV	Instrumental Variable		
LiTS	Life in Transition Survey		
LMA	Loan Market Association		
LPM	Linear Probability Model		
LT	Long Term		
LSTA	Loan Syndications and Trading Association		
MLE	Maximum Likelihood Estimation		
NACE	Nomenclature statistique des Activités économiques dans la Communauté Européenne		
NAICS	North American Industry Classification System		
ODD	Objectifs de Développement Durable		
OECD	Organization for Economic Co-operation and Development		
OLS	Ordinary Least Squares		
PDG	Président-Directeur Général		
PIB	Produit Intérieur Brut		
PSU	Primary Sample Unit		
ROA	Return On Assets		
SDGs	Sustainable Development Goals		
SEM	Structural Equation Modeling		
SLLP	Sustainability Linked Loan Principles		
SLP	Social Loan Principles		
ST	Short Term		

UN	United Nations
WVS	World Values Survey
2SLS	Two-Stage Least Squares

#### **Introduction Générale**

"The key to achieving our goals and enhancing human values is to maintain and continually improve a democratic financial system that takes account the diversity of human motives and drives." Shiller (2012, p. 239)

Dans son ouvrage *Finance and the Good Society*, Shiller (2012) repense la notion de finance et son rôle dans la société, en remettant en cause la croyance commune selon laquelle la finance est motivée par la cupidité et crée des inégalités. Au contraire, il décrit la finance non pas simplement comme la manipulation de l'argent ou la gestion des risques, mais comme « the stewardship of society's assets », c'est-à-dire l'un des outils les plus puissants dont dispose la société pour résoudre les enjeux sociaux et accroître le bien-être général. Shiller préconise donc un système financier qui ne se contente pas de remplir des fonctions économiques, mais qui cultive également le bien-être social en s'alignant sur la société. La finance pourrait contribuer positivement au développement de la société si elle était conçue pour intégrer les diverses valeurs humaines au sein du système financier. Ainsi, la finance pourrait à la fois servir le développement de la société mais aussi être façonnée par les valeurs et les objectifs de la société. Cette thèse vise à explorer empiriquement cette interaction particulière entre les banques et la société.

La société est communément définie comme un groupe d'individus vivant ensemble dans une zone géographique, partageant une culture commune avec une identité collective distincte, et suivant les mêmes modèles structurés et organisés de relations et d'interactions. Les sociologues considèrent la société comme une entité rassemblant un réseau de relations dynamiques, notamment, une société transcende ses individus (Durkheim, 1893) et est façonnée par des interactions structurées par des dynamiques de pouvoir, auxquelles les gens attachent des significations différentes (Weber, 1922). Pour Engels et Marx (1848), la société est fondée sur le conflit entre les groupes sociaux. Puisqu'une société rassemble des membres ayant des situations et des aspirations différentes, des tensions et des conflits sont inévitables, à la fois pour l'ensemble du système et entre les individus, ce qui entraîne des problèmes sociétaux ou sociaux. Ces problèmes sont largement reconnus et signalent un dysfonctionnement au sein de la structure sociale (Merton, 1957) en pouvant empêcher la société de bien fonctionner. Leur résolution nécessite souvent une action collective (Hart, 1923) et ils sont liés à des questions organisationnelles et procédurales plus vastes, ancrées dans la structure de la société plutôt que dans un individu en particulier (Mills, 1959). En d'autres termes, les problèmes sont considérés comme sociaux lorsqu'ils vont à l'encontre des valeurs communes partagées dans la société. Ainsi, les problèmes sociaux sont souvent la source d'opinions contradictoires et peuvent être rectifiées par la mise en œuvre de politiques ou une action collective des citoyens.

De ce point de vue, une société peut être confrontée à divers enjeux, qui peuvent se manifester dans une variété de domaines, se croisant et s'exacerbant. Tout d'abord, une société peut être confrontée à des problèmes économiques, tels que la pauvreté, le chômage ou les inégalités économiques. Ensuite, une société peut souffrir de problèmes sociaux enracinés dans des discriminations basées sur des caractéristiques individuelles, comme le genre, l'âge, ou l'ethnie ou sur des inégalités en matière d'éducation et de santé. De plus, une société peut être confrontée à des problèmes liés à l'environnement, tels que le changement climatique, la pollution ou la pénurie de ressources. Enfin, les enjeux sociétaux peuvent inclure des problèmes politiques et institutionnels tels que la corruption, les droits civils, la criminalité ou l'urbanisation. Les problèmes sociétaux et sociaux affectant le bien-être, la qualité de vie, l'égalité et le développement global de la société, il est essentiel de les résoudre. Traiter les problèmes sociaux liés à la discrimination est essentiel pour étendre les libertés et les capacités individuelles, qui sont indispensables au développement humain (Sen, 1999) et à une meilleure qualité de vie (Nussbaum, 2011). De plus, la réduction des inégalités de revenus favorise la croissance économique (Barro, 1999 ; Banerjee et Duflo, 2003).

L'intermédiation financière effectuée par les banques peut jouer un rôle clé pour relever les enjeux sociétaux. Au cours de l'histoire, le développement de la société a été étroitement lié au développement du secteur bancaire (Da Rin et Hellmann, 2002 ; Benfratello, Schiantarelli et Sembenelli, 2008 ; Beck, Demirgüç-Kunt et Levine, 2007 ; Rajan et Zingales, 1998 ; Jaremski, 2014). En réallouant les ressources financières par la collecte de dépôts et la distribution de crédits à des usages productifs, les banques facilitent la circulation de la monnaie, le financement de l'industrie et la gestion de l'épargne. Les banques ont ainsi accompagné le développement de l'économie, les révolutions industrielles et la globalisation financière en finançant l'innovation (Jaremski, 2014 ; Da Rin et Hellmann, 2002 ; Benfratello, Schiantarelli et Sembenelli, 2008). Des recherches séminales ont montré que les banques favorisent la croissance économique (Popov, 2018), tandis que le développement financier a un effet positif à long terme sur la croissance économique aux niveaux macro et micro (King et Levine, 1993 ; Beck, Demirgüç-Kunt, et Levine, 2007 ; Beck, Levine, et Loayza, 2000). La finance soutient la croissance économique en mobilisant l'épargne par une gestion efficace des risques, en réduisant les coûts de transaction pour faciliter les échanges, en allouant efficacement le capital en étudiant les opportunités d'investissement, et en encourageant l'investissement par le suivi de la gouvernance d'entreprise (Levine, 2005).

Compte tenu du rôle clé des banques dans le développement économique, il est évident que les activités bancaires peuvent avoir un impact sur le développement de la société. Comment les banques peuvent-elles alors promouvoir le développement de la société en traitant ses problèmes ? Il est fondamental de répondre à cette question, car les banques peuvent réaffecter les ressources financières vers certains individus ou certains projets, qui ont un impact direct sur les variables sociales.

Pour lutter contre la pauvreté et favoriser la croissance économique, les banques peuvent fournir des services financiers à la société. Dans sa définition traditionnelle, l'inclusion financière fait référence à l'utilisation de services financiers formels. L'inclusion financière commence souvent par la possession d'un compte bancaire, qui permet d'épargner et d'emprunter de l'argent, et d'accéder à d'autres services financiers<sup>1</sup>. Au cours des deux dernières décennies, l'inclusion financière est devenue un élément clé du développement, car elle contribue à réduire la pauvreté et à améliorer le bien-être des ménages (Sahay et al., 2015 ; Demirgüç-Kunt, Klapper et Singer, 2017). Bien que des progrès significatifs aient été réalisés, près d'un tiers des adultes dans le monde n'étaient pas bancarisés en 2021<sup>2</sup>. La promotion de l'inclusion financière s'explique par les nombreux avantages qu'elle présente. L'inclusion financière favorise le développement économique en stimulant la croissance économique (Kim, Yu et Hassan, 2018), en réduisant la pauvreté (Neaime et Gaysset, 2018), en freinant l'évasion fiscale (Beck, Lin et Ma, 2014), et en atténuant les inégalités énergétiques (Dong et al., 2024). Elle renforce également l'efficacité du système financier, en améliorant la stabilité (Cull, Demirgüç-Kunt et Lyman 2012 ; Ahamed et Mallick, 2019) et la performance des

<sup>&</sup>lt;sup>1</sup> Source : Work Bank Group : <u>https://www.worldbank.org/en/topic/financialinclusion/overview</u>

<sup>&</sup>lt;sup>2</sup> Source : The Findex Database 2021, The World Bank

banques (Ahamed et al., 2021). En favorisant le développement social et économique, l'inclusion financière peut améliorer le bien-être individuel et la satisfaction de la vie. Il est donc très important d'étudier les conséquences sociales de l'inclusion financière pour comprendre comment les activités bancaires peuvent améliorer le développement de la société.

Par ailleurs, les banques peuvent décroître les inégalités économiques et sociales en réallouant les ressources financières à certains groupes d'individus. Les banques peuvent contribuer à réduire les disparités sociales entre les individus en déterminant qui elles financent. L'exclusion financière des individus est profondément liée à leurs caractéristiques socioéconomiques, comme leur revenu, leur genre ou leur âge (Zins et Weill, 2016) ou leur statut de ruralité (Lopez et Winkler, 2018). En 2021, les femmes, les ménages à faible revenu dans les zones rurales et les personnes sans emploi représentaient environ la moitié de la population non bancarisée, tandis qu'entre 2017 et 2021, l'écart entre les genres en matière de possession d'un compte dans les pays en développement s'est réduit, passant de 9 % à 6 %<sup>3</sup>. Toutefois, cet écart empêche encore de nombreuses femmes de prendre pleinement en main leur vie financière. Cette exclusion limite leurs opportunités économiques et leur autonomie, perpétuant ainsi les inégalités entre les genres. Par conséquent, fournir des services bancaires aux femmes peut également résoudre indirectement d'autres problèmes sociaux liés aux inégalités de genre. Il est donc important d'explorer les déterminants de l'inclusion financière et de l'accès au crédit afin de reconnaître comment les services bancaires peuvent promouvoir un développement social plus égalitaire.

Enfin, les activités bancaires peuvent promouvoir un développement durable en réaffectant des ressources financières à des projets durables. Les décisions de prêt des banques peuvent avoir des impacts environnementaux et sociaux significatifs pour la société. Bien que le mouvement mondial en faveur du développement économique durable se soit intensifié au cours de la dernière décennie, le monde reste confronté à des défis persistants en matière de développement durable, comme l'indique le récent rapport des Nations Unies sur les objectifs de développement durable (ODD) de 2024<sup>4</sup>. En réallouant les ressources, le rôle des banques dans l'accomplissement des ODD est devenu un sujet de préoccupation majeur. Les banques peuvent jouer un rôle crucial dans le développement durable en intégrant des critères

<sup>4</sup> Le rapport 2024 des Nations Unies sur les ODDs est accessible ici :

<sup>&</sup>lt;sup>3</sup> Source : The Findex Database 2021, The World Bank

https://unstats.un.org/sdgs/report/2024/The-Sustainable-Development-Goals-Report-2024.pdf

environnementaux, sociaux et de gouvernance (ESG) dans leur prise de décision financière en promouvant des projets durables (Commission Européenne, 2020). Il est donc essentiel d'étudier les déterminants de l'accès aux services financiers durables. L'étude de ces déterminants peut guider les décideurs politiques dans la mise en œuvre de réglementations visant à promouvoir la durabilité et à améliorer le bien-être global de la société.

Les activités bancaires peuvent contribuer au développement de la société en améliorant le bien-être des individus grâce à la réallocation des ressources financières. Toutefois, le secteur bancaire a fait l'objet de nombreuses critiques (Stiglitz, 2010), comme notamment la priorisation des profits à court terme plutôt que des objectifs sociétaux. Ce désalignement des intérêts entre la société et les banques peut conduire les banques à une prise de risque excessive, déclenchant des crises financières et économiques. Le secteur bancaire est également confronté à des problèmes éthiques lorsque les banques financent des projets susceptibles d'exacerber les inégalités sociales ou de nuire à l'environnement. Les controverses sur les produits financiers opaques et les allégations de blanchiment d'argent ou d'évasion fiscale ont d'autant plus fragilisé la confiance dans le secteur bancaire (Stiglitz, 2010).

La question de la confiance dans les banques est particulièrement importante depuis la crise financière de 2008, considérée comme une « *trust crisis* » (Sapienza et Zingales, 2012), qui a provoqué une chute considérable de la confiance dans les banques. Quelques recherches portant sur un pays ont souligné l'influence négative à long terme des crises financières sur la confiance dans les banques, suggérant la fragilité de la confiance dans les banques (Sapienza et Zingales, 2012 ; Carbo-Valverde, Maqui Lopez et Rodríguez-Fernández, 2013 ; Jansen, Mosch et van der Cruijsen, 2015 ; Knell et Stix, 2015 ; Fungáčová, Hasan et Weill, 2019 ; Fungáčová, Kerola et Weill 2022). Selon le baromètre de confiance Edelman 2024, le secteur des services financiers reste l'une des industries les moins dignes de confiance<sup>5</sup>. Malgré ce classement, la confiance dans les institutions financières est pourtant clé pour l'efficacité du système financier. Tout d'abord, la confiance dans les banques garantit la stabilité du système financier (Guiso, 2010) en limitant un retrait massif des dépôts provoquant des paniques bancaires menant à des crises financières (Jaffer, Morris et Vines, 2014). De plus, la confiance dans les banques est essentielle à la participation des individus au système financier. Sans

<sup>&</sup>lt;sup>5</sup> Le rapport 2024 Edelman Trust Barometer est accessible ici : <u>https://www.edelman.com/trust/2024/trust-barometer</u>

confiance, les individus n'utiliseraient pas de services financiers. Comme cette confiance est essentielle pour encourager les individus à utiliser les services financiers, la confiance dans les banques est également nécessaire au développement financier. Un manque de confiance pourrait entraver le développement financier, limitant le rôle des banques dans la résolution des problèmes sociétaux. La mise en œuvre de politiques favorisant la confiance dans les banques pourrait promouvoir l'utilisation de services financiers qui stimulent le développement de la société. Il est donc essentiel de comprendre ce qui peut la préserver et comment la confiance peut favoriser le développement financier, afin que les individus puissent bénéficier de services bancaires.

Étant donné l'importance des banques pour le développement de la société, comment la société façonne-t-elle les banques pour aligner les pratiques bancaires sur ses valeurs ? La question de l'influence de la société sur les banques est d'une importance majeure puisque les ressources financières jouent un rôle clé dans le développement de la société.

La société peut jouer un rôle crucial en influençant la gouvernance et les pratiques bancaires des banques. Les normes sociales et les valeurs partagées dans la société peuvent faire pression sur les banques pour qu'elles s'alignent sur les aspirations communes des individus. La société peut influencer les banques par la mise en place de législations. Par exemple, l'idéal social d'égalité peut pousser les banques à adopter des normes sociales de représentativité dans les comités de direction des banques. Ces dernières années, les pays européens ont connu un vaste mouvement en faveur de la représentation des femmes dans les conseils d'administration des entreprises. De nombreux pays européens, tels que la Norvège, la France et les Pays-Bas, ont introduit des quotas de genre. Au sein de l'Union Européenne, la politique d'équilibre entre les genres dans les conseils d'administration des entreprises a récemment franchi une étape supplémentaire grâce à la directive adoptée par le Parlement Européen et le Conseil en juin 2022. Cette directive exigeant qu'au moins 40 % des membres non exécutifs des conseils d'administration des sociétés cotées en bourse soient des femmes à partir de 2026, s'inscrit dans le cadre d'un engagement mondial visant à promouvoir l'égalité des chances entre les hommes et les femmes. Dans le secteur bancaire européen, le top management reste un monde d'hommes<sup>6</sup>. Toutefois, les législations européennes sur les quotas

<sup>&</sup>lt;sup>6</sup> <u>https://www.bloomberg.com/news/articles/2023-09-11/several-european-banks-have-no-female-top-execs-study-finds?embedded-checkout=true</u>

de genre ont permis d'augmenter le pourcentage de femmes dans les conseils d'administration des banques à 38 % en 2022<sup>7</sup>. Par ailleurs, la préservation de l'environnement promue par la société peut influencer les pratiques bancaires, en poussant les banques à entreprendre des projets plus durables. Les directives environnementales se multiplient depuis les premières mesures prises par l'Accord de Paris au sein des Nations Unies (Nations Unies, 2015a). De nouvelles directives, telles que la récente directive European Corporate Sustainability Reporting Directive (CSRD)<sup>8</sup>, visent à instaurer une plus grande transparence sur les impacts environnementaux des entreprises. Ces règlementations mise en place par la société peuvent modifier la structure des dirigeants et des pratiques bancaires.

Enfin, la société influence les pratiques bancaires par le biais des normes sociales intériorisées par ses membres. En tant que membres de la société, les dirigeants des banques ont intégré les normes et les valeurs sociales. Leurs actions sont guidées par les normes sociales qu'ils ont intégrées, parfois de manière inconsciente. Par exemple, les femmes ont une plus grande aversion au risque que les hommes (Barber et Odean, 2001 ; Croson et Gneezy, 2009). Les femmes ont un comportement plus prosocial, avec une plus grande empathie (Kamas et Preston, 2021) et un plus grand altruisme (Cox et Deck, 2007). L'âge joue également un rôle important dans le comportement des individus. Des recherches ont montré que l'âge influence les préoccupations et les attitudes des individus à l'égard de la durabilité (par exemple, Wiernik, Ones et Dilchert, 2013 ; Gifford et Nilsson, 2014 ; Lewis, Palm et Feng, 2019 ; Mohai et Twight, 1987), ainsi que leurs comportements durables (par exemple, Wiernik, Ones et Dilchert, 2013 ; Gifford et Nilsson, 2014 ; Wiernik, Dilchert et Ones, 2016). Les caractéristiques socio-économiques des dirigeants des banques peuvent donc influencer leurs décisions dans les banques. Par conséquent, les normes sociales intégrées par les dirigeants des banques peuvent influencer les pratiques de prêt des banques. L'influence des normes sociales des dirigeants des banques est un sujet d'intérêt puisqu'elles peuvent influencer l'allocation des ressources financières par les banques, influençant ainsi le développement de la société.

<sup>&</sup>lt;sup>7</sup> En comparaison avec les autres secteurs, 19,7% des membres des conseils d'administration étaient des femmes, et 5,0% des PDG étaient des femmes dans le monde en 2021, selon la dernière étude de Deloitte en 2022. Cette étude est disponible à :

 $<sup>\</sup>underline{https://www.deloitte.com/global/en/services/risk-advisory/research/women-in-the-boardroom-seventh-edition.html}$ 

<sup>&</sup>lt;sup>8</sup> La directive CSRD est accessible ici :

https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting\_en#legislation

L'objectif de cette thèse est donc d'explorer l'interaction entre les banques et la société. Ce travail approfondit la question suivante : **comment les banques peuvent-elles promouvoir le développement de la société et comment la société peut-elle contribuer à façonner les banques ?** L'objectif de cette thèse est de contribuer à la littérature sur les conséquences sociales et sociétales des activités bancaires et sur les déterminants sociaux des pratiques bancaires. Étant donné le rôle clé des ressources financières dans le développement de la société, l'étude de l'interaction entre les banques et la société est essentielle pour traiter les problèmes de la société et améliorer le bien-être général des individus. L'étude des conséquences sociales et sociétales des pratiques bancaires peut aider les décideurs politiques à mettre en œuvre des réglementations favorisant les activités bancaires qui peuvent contribuer à résoudre les problèmes sociaux. Ensuite, la compréhension des déterminants sociaux et sociétaux de l'attribution des services bancaires est cruciale pour mettre en œuvre des législations visant à mieux promouvoir l'accès aux services financiers afin d'améliorer le développement de la société.

Ce travail vise à examiner l'interaction entre les banques et la société en couvrant successivement les principaux enjeux sociétaux du domaine bancaire, tels que la confiance dans les banques, l'inclusion financière et l'accès au crédit. Ces sujets seront abordés dans cinq essais empiriques et indépendants. Premièrement, la confiance dans les banques est une condition nécessaire pour que les individus utilisent les services financiers. Les banques ne peuvent promouvoir le développement de la société par l'utilisation de services financiers que si les individus leur font confiance. Les deux premiers chapitres se concentreront donc sur les déterminants et les conséquences de la confiance dans les banques. Le premier chapitre examinera ses déterminants, en montrant que des facteurs économiques, tels que l'inflation, peuvent entraver la confiance dans les banques, ce qui peut décourager les individus d'utiliser les services financiers et donc limiter le développement de la société. Bien que la confiance dans les banques soit fragile, le chapitre suivant montre qu'elle est un déterminant essentiel de l'inclusion financière. Le deuxième chapitre étudiera les conséquences de la confiance dans les banques, en attestant du rôle universel de la confiance dans les banques dans l'utilisation des services financiers. La confiance dans les banques favorise l'inclusion financière, ce qui peut contribuer à résoudre les problèmes de sous-développement. Si les individus doivent faire confiance aux banques pour être inclus financièrement, l'utilisation des services financiers améliore le bien-être de la société. Le troisième chapitre démontre que les banques peuvent favoriser le bien-être de la société grâce à l'utilisation de services financiers. Les conséquences

de l'inclusion financière seront étudiées : il s'agira d'expliquer comment l'inclusion financière accroît le bonheur de la société.

Si les banques peuvent améliorer le bien-être de la société, elles peuvent également promouvoir le développement social en choisissant des dirigeants représentatifs qui décident qui et quels projets peuvent bénéficier de leurs services financiers. Les deux chapitres suivants explorent cette question. Le chapitre quatre indique que les banques dirigées par des femmes prêtent moins aux entreprises dirigées par des hommes, mais que cet effet n'est pas vérifié pour les entreprises dirigées par des femmes. Plus généralement, le genre des dirigeants des banques influence l'octroi des prêts aux entreprises. Cela nous apprend que les normes de genre influencent les pratiques bancaires. Par conséquent, ce chapitre examine également la manière dont les normes sociales façonnent les activités bancaires. Enfin, le dernier chapitre s'inscrit dans cette lignée en examinant comment les valeurs sociales liées à l'âge des dirigeants des banques expliquent la durabilité des prêts accordés. Il montre également comment le secteur bancaire peut promouvoir le développement durable de la société.

Le premier chapitre est intitulé « *Never Forget, Never Forgive : The impact of Inflation on Trust in Banks* » et explore les déterminants de la confiance dans les banques, en étudiant l'impact de l'inflation sur la confiance dans les banques des individus. Cette confiance étant essentielle pour garantir l'efficacité du système financier, il est primordial de comprendre quels sont les facteurs qui l'influencent. L'inflation influence l'utilisation des services financiers et peut donc affecter la confiance dans les institutions financières.

En érodant la valeur de l'épargne des particuliers, l'inflation diminue les avantages des dépôts. Par ailleurs, les banques centrales peuvent augmenter les taux d'intérêt pour lutter contre l'inflation. Cela peut entraîner des difficultés financières pour les ménages endettés et les entreprises ayant contracté des prêts à taux variable, et réduire l'accès au crédit, limitant ainsi les possibilités d'accession à la propriété ou de création d'entreprises. Par conséquent, l'inflation devrait avoir un effet négatif sur la confiance dans les banques. Quelques études portant sur un pays ont examiné les facteurs influençant la confiance dans les banques, mais leurs résultats sont mitigés. Knell et Stix (2015) ont constaté que l'inflation avait un effet négatif sur la confiance dans que Fungáčová et Weill (2018) ont constaté que l'inflation n'avait aucun effet en Chine.

Ce chapitre vise donc à apporter trois extensions à la littérature. Premièrement, il examine si l'inflation détériore la confiance dans les banques, conformément à l'hypothèse selon laquelle l'inflation érode l'épargne et entrave l'accès au crédit. Deuxièmement, cet essai examine les conséquences à court terme mais aussi à long terme de l'inflation, en étudiant l'impact de l'inflation récente et de l'inflation vécue tout au long de la vie. Troisièmement, il teste si l'effet négatif de l'inflation sur la confiance dans les banques varie en fonction des caractéristiques des individus. Pour réaliser l'étude, nous utilisons les vagues 6 et 7 du World Values Survey (WVS) (Haerpfer et al., 2018, 2022), qui contiennent des informations au niveau individuel sur la confiance dans les banques et d'autres caractéristiques personnelles. En se basant sur l'année de naissance de l'individu, de son pays de résidence et de l'année du questionnaire, nous lions le niveau de confiance dans les banques à l'inflation récente et à l'inflation moyenne vécue au cours de la vie. L'échantillon rassemble environ 143 000 observations provenant de 72 pays et collectées entre 2010 et 2022.

L'étude empirique indique que l'inflation, qu'elle soit récente ou vécue tout au long de la vie, détériore la confiance actuelle des individus dans les banques. Cela confirme l'idée que l'inflation exerce une influence à la fois à court et à long terme sur la confiance dans les banques. Des estimations additionnelles montrent que l'éducation et l'accès à l'information influencent cet effet. L'effet est plus important pour les individus plus éduqués et pour les individus ayant un accès quotidien aux journaux. Nous constatons également que l'inflation exerce un impact distinct sur la confiance dans les banques par rapport à la confiance dans les institutions. Ce premier chapitre démontre les potentielles conséquences négatives des facteurs économiques sur la confiance dans les banques. En particulier, la lutte contre l'inflation peut empêcher une réduction de la confiance dans les banques sur le long terme. Comme les problèmes économiques récents et plus anciens détériorent la confiance dans les banques, celleci est fragile et peut être difficile à rétablir. Cependant, la confiance dans les banques est un élément moteur du développement financier de la société.

Le deuxième chapitre, intitulé « *Trust in Banks and Financial Inclusion : Micro-Level Evidence from 28 Countries* », vise à explorer les conséquences de la confiance dans les banques sur l'inclusion financière des individus. Deux raisons sont principalement invoquées pour justifier l'importance du maintien de la confiance dans les banques. La première est d'empêcher les retraits massifs des dépôts pour assurer la stabilité financière. Des études ont montré que la confiance dans les banques joue un rôle dans le maintien de la stabilité financière
(par exemple, Guiso, 2010 ; Chernykh, Davydov, et Sihvonen, 2019). La deuxième raison est l'impact positif de la confiance dans les banques sur l'inclusion financière. Une plus grande confiance dans les banques peut encourager les gens à déposer leur épargne et à demander des prêts, ce qui favorise l'inclusion financière.

Cependant, les preuves de l'effet de la confiance dans les banques sur l'inclusion financière sont encore limitées. Seules trois études portant sur un seul pays ont exploré cette question : Ampudia et Palligkinis (2018) pour l'Italie, Ghosh (2021) pour l'Inde, et Koomson, Koomson et Abdul-Mumuni (2023) pour le Ghana. Ces travaux montrent l'impact positif de la confiance dans les banques sur l'inclusion financière. Néanmoins, cet effet positif de la confiance dans les banques sur l'inclusion financière est loin d'être évident. D'une part, la confiance dans les banques peut ne pas jouer un rôle important dans l'explication de l'inclusion financière par rapport à d'autres déterminants. Les recherches sur les déterminants de la confiance dans les banques montrent l'influence de nombreux facteurs, tels que les caractéristiques personnelles comme le genre ou l'âge (Fungáčová, Hasan et Weill, 2019), ou la confiance générale (Xu, 2020). D'autre part, la confiance dans les banques est la plus faible dans les pays développés (Fungáčová, Hasan et Weill, 2019), où le niveau d'inclusion financière est le plus élevé, ce qui signifie que de faibles niveaux de confiance dans les banques et des niveaux élevés d'inclusion financière peuvent coexister. Les habitants de ces pays peuvent utiliser des services financiers même s'ils ne font pas entièrement confiance aux banques, car ils les aident dans leurs activités quotidiennes et sont souvent nécessaires pour les transactions.

L'objectif de ce chapitre est donc d'examiner l'impact de la confiance dans les banques sur l'inclusion financière dans plusieurs pays et sur plusieurs années. Une étude sur plusieurs pays rend les conclusions plus largement généralisables, car les résultats d'un pays peuvent ne pas être représentatifs des autres. Elle enrichit également la littérature en explorant les facteurs individuels susceptibles d'affecter la relation entre la confiance dans les banques et l'inclusion financière. Pour mener cette recherche, nous utilisons les données des questionnaires Life in Transition Survey (LiTS), menée par la Banque Européenne pour la Reconstruction et le Développement en 2006, 2010 et 2016. Cette enquête fournit des données individuelles sur la confiance dans les banques et l'inclusion financière. L'échantillon comprend environ 61 000 réponses provenant de 28 pays d'Europe centrale et orientale et d'Asie centrale. Les résultats indiquent une relation positive entre la confiance dans les banques et l'inclusion financière. De plus, cet effet positif est cohérent sur l'ensemble des années étudiées et se vérifie pour la quasi-totalité des pays de l'échantillon. L'effet affecte les individus indépendamment de leurs caractéristiques ou de leur situation financière. Certaines caractéristiques des pays, telles que le PIB par habitant et le pourcentage de musulmans, influencent l'impact de la confiance dans les banques sur l'inclusion financière. La confiance dans les banques, par rapport à la confiance dans les institutions, a un effet positif sur l'inclusion financière. Dans l'ensemble, ce chapitre soutient fortement l'idée que la confiance dans les banques joue un rôle important dans l'augmentation de l'inclusion financière dans le monde. Les services financiers fournis par les banques peuvent favoriser le bien-être de la société.

Le troisième chapitre, intitulé « *Is Financial Inclusion a Source of Happiness?* », examine si, et comment, l'utilisation des services financiers peut améliorer le bien-être, en explorant les conséquences de l'inclusion financière sur le bonheur des individus. Il existe un large consensus dans la littérature sur le fait que l'inclusion financière peut aider à relever les enjeux de développement. En particulier, un compte bancaire est censé offrir de nombreux avantages aux individus. Il simplifie les transactions quotidiennes, garantit la confidentialité et la sécurité en réduisant le risque de délits liés à l'argent liquide et, surtout, facilite l'accès au crédit, ce qui permet d'investir dans des biens essentiels tels que l'éducation, le logement ou la création d'une entreprise.

Cependant, il existe peu de preuves de l'effet de l'inclusion financière sur les individus, notamment en termes de bonheur. S'il peut sembler évident que la croissance économique associée à l'inclusion financière conduirait à une plus grande satisfaction dans la vie, de précédentes recherches ont montré que le fait de vivre dans une économie en croissance ne signifie pas nécessairement que les gens sont plus satisfaits dans leur vie (Guriev et Melnikov, 2018). De plus, ce n'est pas parce que l'inclusion financière contribue à la croissance économique au niveau national que les personnes incluses financièrement sont nécessairement plus heureuses.

Le troisième chapitre vise donc à examiner si l'inclusion financière améliore le bonheur des individus et à explorer les canaux et les facteurs modérateurs qui peuvent déterminer cet effet. Pour cette étude, nous utilisons les données des trois vagues (2006, 2010 et 2016) des questionnaires Life in Transition Survey (LiTS) de la Banque Européenne pour la Reconstruction et le Développement. Ces questionnaires fournissent des informations individuelles sur l'inclusion financière, la satisfaction dans la vie et d'autres facteurs sociodémographiques. L'ensemble des données comprend 59 209 observations provenant de 29 pays, principalement d'Europe centrale et orientale et d'Asie centrale, ce qui nous permet de disposer d'un échantillon diversifié en termes d'inclusion financière, de développement économique et institutionnel.

La principale conclusion de ce chapitre est que l'inclusion financière améliore la satisfaction dans la vie. Ce résultat se vérifie à travers plusieurs tests, y compris des contrôles pour les différences régionales et différents modèles économétriques. Ensuite, l'étude des canaux révèle que l'inclusion financière exerce une influence positive sur le bonheur, en améliorant l'accès à l'éducation, à la santé et la probabilité de créer une entreprise, qui à leur tour conduisent à une plus grande satisfaction dans la vie. De plus, nous constatons que l'impact positif de l'inclusion financière varie selon les pays. Il est plus fort dans les pays où les revenus sont élevés et plus faible dans ceux qui ont été récemment touchés par des crises financières. Cet article démontre le rôle majeur de l'inclusion financière dans l'amélioration du bien-être de la société. Si les banques peuvent favoriser le bien-être de la société, elles peuvent également favoriser le développement social en choisissant des conseils d'administration et les personnes à qui elles accordent leurs services.

Le chapitre quatre est intitulé « *Does Bank Female Leaders Affect Firm Credit?* » et explore l'influence du genre des dirigeants des banques sur l'accès au crédit des entreprises. Ces dernières années, la représentation des femmes dans les conseils d'administration des entreprises a augmenté dans les pays européens. Étant donné que les banques jouent un rôle clé dans l'économie en fournissant des financements, il est important de comprendre si la présence d'un plus grand nombre de femmes à la tête des banques a un effet sur l'allocation du crédit. L'accès au crédit bancaire est crucial pour les entreprises, en particulier en Europe, où les prêts bancaires représentent la majorité des financements des entreprises. Sans crédit bancaire, les entreprises ne peuvent pas entreprendre leurs projets, ce qui limite la croissance des entreprises et de l'économie.

L'effet de la présence de femmes à la tête des banques sur l'accès au crédit des entreprises est loin d'être évident. D'une part, on peut argumenter qu'un plus grand nombre de femmes parmi les dirigeants pourrait réduire l'accès au crédit parce que les femmes ont tendance à être plus averses au risque (Barber et Odean, 2001 ; Croson et Gneezy, 2009), ce qui pourrait conduire à des politiques de prêt plus strictes. Si cette aversion au risque est généralement une bonne chose pour la stabilité et la performance des banques, elle pourrait toutefois limiter le montant des crédits accordés pour les entreprises. D'autre part, la plus grande empathie et le comportement prosocial des femmes (Kamas et Preston, 2021 ; Cox et Deck, 2007) pourraient conduire les dirigeantes à être plus indulgentes en matière de prêt, ce qui pourrait favoriser l'accès au crédit des entreprises.

L'objectif de cet article est d'examiner comment le genre des dirigeants des banques affecte l'accès au crédit des entreprises. Pour ce faire, nous expliquons la dette bancaire au niveau de l'entreprise, par le genre des dirigeants des banques, ainsi que d'autres facteurs au niveau de l'entreprise et du pays. Nous utilisons la base de données Amadeus pour identifier les banques qui prêtent à chaque entreprise et nous la combinons avec les données bancaires de Bankfocus pour créer un vaste échantillon d'environ 116 000 entreprises provenant de onze pays européens.

Les résultats montrent qu'une plus grande proportion de femmes parmi les dirigeants des banques réduit la dette bancaire des entreprises. Plus de dirigeantes diminue la dette de long terme, mais augmente l'accès à la dette de court terme. L'effet négatif sur la dette de long terme peut être dû à l'aversion au risque plus élevée associée à ce type de prêt. Nous constatons également que cet effet est négatif uniquement pour les entreprises dirigées par des hommes, ce qui suggère une préférence pour les prêts pour les personnes du même genre (Beck, Behr et Madestam, 2018). Cet effet diminue quand la taille de l'entreprise augmente, bien que la performance de l'entreprise ne semble pas avoir d'importance. Dans l'ensemble, les résultats suggèrent qu'une plus grande proportion de dirigeantes peut entraver l'accès au crédit des entreprises. Cela indique que des facteurs sociaux tels que le genre peuvent affecter la manière dont les banques allouent les crédits. Cependant, les valeurs sociales peuvent-elles également influencer les pratiques durables des banques ?

Le chapitre cinq, intitulé « Young Leaders, Sustainable Lenders? How Bank Leaders' Age Influences Sustainable Lending » examine l'effet de l'âge des membres du conseil d'administration et des comités exécutifs des banques sur les prêts durables. Ces dernières années, les efforts pour un développement plus durable se sont intensifiés au niveau mondial. Le rapport 2024 des Nations Unies sur les ODD<sup>9</sup> souligne les enjeux mondiaux persistants et la nécessité urgente d'atteindre les 17 ODD énoncés dans l'Agenda 2030 pour le développement durable (Nations Unies, 2015b). Ces objectifs portent sur des enjeux tels que la pauvreté, les inégalités et le changement climatique. En tant que principaux pourvoyeurs de financements, les banques peuvent contribuer à ce tournant durable en intégrant des critères ESG dans leur processus décisionnel et en allouant des fonds à des projets qui favorisent la durabilité (Commission Européenne, 2020). Malgré la croissance des prêts durables, les recherches sur leurs déterminants restent limitées.

L'objectif de ce chapitre est donc d'étudier l'influence de l'âge des dirigeants des banques sur les pratiques de prêts durables. L'effet de l'âge des dirigeants des banques sur les prêts durables n'est pas si évident. D'une part, les jeunes dirigeants des banques peuvent être plus enclins à s'engager dans des pratiques durables. L'un des arguments avancés est que les jeunes sont plus susceptibles d'être sensibles aux enjeux de développement durable. Alors que les stéréotypes courants véhiculés par les médias montrent que les personnes âgées sont moins soucieuses de l'environnement que les jeunes (Irvine, 2012 ; Twenge, Campbell et Freeman, 2012), de nombreuses études confirment également ces stéréotypes en démontrant que les jeunes sont plus soucieux de l'environnement et plus disposés à agir pour le protéger (Gifford et Nilsson, 2014 ; Lewis, Palm et Feng, 2019). D'autre part, si la plupart des études ont montré que les préoccupations environnementales sont plus fortes chez les jeunes, les personnes plus âgées adoptent des comportements plus favorables à l'environnement que les jeunes (Gifford et Nilsson, 2014, Wiernik, Dilchert et Ones, 2016).

Pour explorer cette question, je crée une large base de données, combinant les données sur les prêts syndiqués de Refinitiv Eikon, les données au niveau des banques de Bankfocus et les données au niveau des entreprises de Refinitiv Eikon. L'échantillon final rassemble des données sur 6 578 prêts émis en 2022-2023 par 3 692 entreprises et accordés par 274 banques de 30 pays à travers le monde. Je définis les prêts durables comme des prêts utilisés à des fins écologiques ou sociales, des prêts liés à la durabilité, dont les conditions peuvent être modifiées

<sup>&</sup>lt;sup>9</sup> Le rapport est accessible ici :

https://unstats.un.org/sdgs/report/2024/The-Sustainable-Development-Goals-Report-2024.pdf

en fonction de la réalisation par l'emprunteur de certains objectifs ESG, et des prêts accordés à des industries classées comme durables par Refinitiv Eikon. J'effectue des régressions probit en expliquant la caractéristique durable du prêt par l'âge moyen des dirigeants des banques ainsi que sur d'autres variables de control.

Le principal résultat est que les prêts durables sont nettement moins susceptibles d'être accordés par une banque dont les membres du conseil d'administration et des comités exécutifs sont plus âgés, ce qui est cohérent avec l'idée selon laquelle les jeunes sont plus préoccupés par la durabilité. Des estimations supplémentaires montrent que cet effet est générationnel : un prêt durable a plus de chances d'être accordé par une banque où les milléniaux sont plus nombreux, alors que l'inverse est vrai pour la génération silencieuse. En particulier, la présence des plus jeunes dirigeants des banques, plutôt que des plus anciens, influence les prêts durables. Dans l'ensemble, les résultats suggèrent que les jeunes dirigeants peuvent promouvoir le développement durable. Un changement générationnel dans les postes de direction des institutions financières pourrait les conduire à jouer un rôle majeur en matière de durabilité.

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#### Chapter 1<sup>10</sup>

### Never Forget, Never Forgive: The Impact of Inflation on Trust in Banks

#### Abstract

This paper investigates how inflation influences an individual's trust in banks. Using individual data covering 72 countries, we find that inflation, both recent and experienced throughout life, exerts a detrimental influence on trust in banks. Even if recent inflation has a stronger impact, these results support the view that inflation has both short- and long-term effects on trust in banks. Additional estimations show that individual characteristics like education and access to information can affect the negative impact of inflation on trust in banks. Overall, our results indicate that fighting against inflation prevents a lasting reduction of trust in banks.

**JEL Codes**: D83 • E58 • G21 • O16

Keywords: trust • inflation • banking

<sup>&</sup>lt;sup>10</sup> This chapter is co-written with Laurent Weill and has been published in *Applied Economics* (2024).

#### **1.1. Introduction**

The 2022 Edelman Trust Barometer ranks the financial services sector as the least trusted industry in the world. Although the confidence in financial institutions has overall risen for 10 years, trust in the financial services industry has come in last position every year since then<sup>11</sup>. However, trust in financial institutions is a driving component for the effectiveness of the financial system. Trust in banks enhances the financial inclusion and participation of individuals through the collection of deposits and the distribution of credit. Such confidence therefore assures the intermediation role of banks and boosts financial development. If trust in banks benefits the individuals by providing them an access to financial services, it is also key for the stability of the financial system (Guiso, 2010). Trusting banks prevents massive deposits withdrawals triggering banking panics and financial crises (Jaffer, Morris and Vines, 2014).

Since confidence in the banking system plays a crucial role for financial stability and financial development, it is of major importance to know what can preserve it. A natural question that emerges is the influence of inflation on trust in banks.

Inflation exerts a major impact on the use of banking services, and hence can affect the degree of confidence in banks of individuals. On the one hand, inflation erodes the value of savings. As such, it reduces the benefits of deposits for individuals. On the other hand, it can lead to higher interest rates, through central banks' efforts to fight against inflation. It can then trigger financial troubles for indebted households and firms with variable-rate loans, and can hamper access to credit reducing possibilities to become homeowner or to launch a business. We can therefore expect a negative impact of inflation on trust in banks.

Surprisingly the impact of inflation on trust in banks has been scarcely explored in the literature. A few single-country studies have provided insights on this issue when testing a set of potential determinants of trust in banks with mixed results. Knell and Stix (2015) report a negative impact of inflation in Austria while Fungáčová and Weill (2018) find no influence of inflation in China.

The objective of this paper is to provide a broad analysis of the influence of inflation on trust in banks with three major extensions to the literature. First, we test whether inflation exerts a negative influence on trust in banks, in line with the prediction that inflation erodes the value of savings and hampers credit conditions. Unlike former works, we perform this

<sup>&</sup>lt;sup>11</sup> The 2022 Edelman Trust Barometer report can be found on <u>https://www.edelman.com/trust/2022-trust-barometer</u>.

investigation in a cross-country framework, which allows greater heterogeneity in inflation and precludes country-specific findings.

Second, we consider recent inflation but also inflation experienced during the lifetime. Previous literature has shown that memories of systemic banking crises (Osili and Paulson, 2014) and of high inflation last (Ehrmann and Tzamourani, 2012; Malmendier and Nagel, 2016), suggesting that past inflation can affect the present behavior of individuals. Furthermore, Fungáčová, Kerola and Weill (2022) provide evidence that the experience of a banking crisis in life exerts a long-term detrimental influence on trust in banks, supporting the view that past events can affect present trust in banks. Thus, since the experience of a breach of trust can have long-term consequences on the financial behavior, inflation can undermine trust in banks both in the short and long run. We further investigate if the age of the individual when experiencing inflation matters, in line with the finding that early economic experience in life can influence the beliefs of individuals (Malmendier and Nagel, 2011).

Third, we seek to uncover whether individual characteristics affect the relation between inflation and trust in banks. Considering that inflation is not similarly perceived by all individuals (Bryan and Venkatu, 2001; D'Acunto et al., 2021), the impact of inflation on trust in banks can strongly vary across individuals based on their income or their gender among others.

To perform our investigation, we use the 6<sup>th</sup> and 7<sup>th</sup> waves of the World Values Survey (Haerpfer et al., 2018, 2022), including information at the individual level about trust in banks and personal characteristics. Based on the respondent's date of birth, the survey year, and his country of residence, we can link the level of trust in banks to the recent inflation and the mean inflation experienced during lifetime. Our sample contains about 143,000 observations from 72 countries collected between 2010 and 2022.

Our study contributes to three strands of research literature. First, we add to the literature on trust in banks. Research on this topic remains scarce with a few works – mostly single-country - identifying its determinants, notably the influence of financial crises (Sapienza and Zingales, 2012; Carbo-Valverde, Maqui Lopez and Rodríguez-Fernández, 2013; Jansen, Mosch and van der Cruijsen, 2015; Knell and Stix, 2015; Fungáčová, Hasan and Weill, 2019, Fungáčová, Kerola and Weill, 2022). In their recent survey, van der Cruijsen, de Haan and Roerinck (2023) develop a comprehensive review on the determinants of trust in banks. We add to this research by providing evidence about the impact of past and present inflation on trust in banks in a cross-country analysis.

Second, we contribute to the literature on the costs of inflation. A large set of works has examined the real and financial costs of inflation (e.g., Gomme, 1993; Boyd and Champ, 2006). Recent studies have shown that subjective inflation deteriorates central bank credibility (Coleman and Nautz, 2023) and trust in central banks, which impairs public trust (van der Cruijsen, de Haan and van Rooij, 2023). We extend this research by investigating whether inflation can erode trust in banks, which can impair financial stability.

Third, we extend the literature on the effects of inflation experiences on individuals' financial behavior (Bernanke, 2007; Ehrmann and Tzamourani, 2012; Madeira and Zafar, 2015; Caglayan and Xu, 2016; Malmendier and Nagel, 2016; Weber, Gorodnichenko and Coibion, 2022). This literature finds that inflation experiences in life can affect current financial decisions. We add to this research by focusing for the first time on the impact on trust in banks.

The study is structured as follows. Section 1.2 presents data and methodology. Section 1.3 details the main results on the impact of recent and mean inflation on trust in banks. Section 1.4 investigates the effects of individual variables on the relation between inflation and trust in banks. Section 1.5 finally concludes.

#### 1.2. Data and methodology

#### 1.2.1. Measuring trust in banks and inflation

We test the effect of recent and experienced inflation on trust in banks using data coming from the 6<sup>th</sup> (2010-2014) and 7<sup>th</sup> (2017-2022) waves of the World Values Survey (Haerpfer et al., 2018, 2022). The World Values Survey is an international research program conducting a comparative social survey globally, updated every 5 years since its launching in 1981 in a large set of countries. It questions individuals about their perceptions of life and their preferences for economic, cultural, political, and religious values. The dataset aims to be representative of the national population. In our study, we only use data of the two last waves since they are the only ones asking individuals about their level of trust in banks. Depending on the country, observations have been collected between 2010 and 2022. Our sample gathers a total of 143,114 observations from 72 countries.

Trust in banks is measured with the following question in the survey:

"Could you tell me how much confidence you have in banks: is it a great deal of confidence (1), quite a lot of confidence (2), not very much confidence (3) or none at all (4)?"

Our dependent ordinal variable *Trust in banks* is coded with the answers to this question. The variable has been recoded so that 4 defines the highest level of trust and 1 the lowest one. The non-responses being almost negligible (3.8% of the respondents only), they have been omitted to model ordinal outcomes. This choice might therefore have introduced a slight selection bias.

We measure inflation with the consumer price index from the World Development Indicators. We first measure recent inflation with the variable *Inflation* defined by the mean percentage rate of inflation of the three years before the survey year, so that we take into account the level of the current inflation experienced by the respondent. To check the robustness of our results, we also consider an alternative measure of inflation with the variable *Log inflation*. It corresponds to the logarithm of 1 added to the inflation rate. The logarithm of inflation has been previously used in the literature on inflation using time series data (Malmendier and Nagel, 2011; Weber, Gorodnichenko and Coibion, 2022) to reduce extreme values of the variable.

We measure mean inflation experienced during the lifetime with the variable *Mean inflation* representing the average inflation percentage rate experienced by the respondents during their lifetime, in their country. We hence exclude immigrants of our sample, as we do not know their country of origin. If observations are missing for some years in the country during the lifetime of the individual, the mean is computed with the available data. The mean inflation rate experienced by individuals has already been used in previous literature (Malmendier and Nagel, 2016). We also use the alternative measure *Log mean inflation* defined by 1 added to the average inflation rate experienced by the individual.

Moreover, we investigate whether experienced inflation influences trust in banks during the whole lifetime of individuals i.e., whether the age of an individual matters at the time of inflation. To this end, we create two sets of dummy variables based on age brackets, such as Fungáčová, Kerola and Weill (2022) proceeded, we add the age brackets in the models to isolate age effects. We define narrow age brackets with a period of 10 years: from 0 to 10, 11 to 20, 21 to 30, 31 to 40, 41 to 50, 51 to 60 and 61 years old and older. The age brackets take the value of the mean inflation rate experienced by the individual during this 10-years period. Broad age brackets are delimited for a 20-years period. The brackets are generated from 0 to 20, 21 to 40, 41 to 60 and 61 years old and older. They are equal to the average inflation rate experienced by the respondents when they belonged to these ages.

#### 1.2.2. Methodology

To investigate whether inflation impacts trust in banks, we estimate ordered logit models since the dependent variable *Trust in banks* is a discrete variable. To address omitted variables bias, we add to all our ordered logit regressions individual controls, country controls, country and year fixed effects. Reverse causality is not a major concern in our framework since inflation is always measured with past values. To measure the impact of inflation on trust in banks, we thence estimate the following model, where the subscript *i* indexes the individual:

#### Trust in banks<sub>i</sub>

 $= \alpha + \beta_1 Inflation_i + \beta_2 Individual controls_i + \beta_3 Country controls_i$  $+ \beta_4 Country fixed effects + \beta_5 Year fixed effects + \varepsilon_i$ 

We select individual control variables based on former works on trust in banks (e.g., Fungáčová, Hasan and Weill, 2019). To control for gender, we include the dummy variable *Female*, equal to one if the individual is a female. We use the variable *Age* equal to the age of the individual in years. *Married* reflects the marital status of the respondent and takes the value one if the respondent is married. *Income* corresponds to the self-reported level of income on a scale of one to ten reported by the respondent, relative to other people in her/his country. One stands for the lowest decile, whereas ten corresponds to the richest one. The indicator is based on the question:

On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is.

The variable *Education* depicts the level of education of the respondent: it is a dummy variable equal to one if the respondent has secondary or tertiary education. Finally, *General trust* is taken into account to consider the disposition of the respondent to trust other people. The influence of general trust has been highlighted in previous cross-country investigations on trust in banks (Afandi and Habibov, 2017; Fungáčová, Hasan and Weill, 2019). *General trust* is a dummy variable equal to one if the respondent declares that most people can be trusted and zero if he considers that we need to be very careful.

We also control for the type of media used for access to information, since Fungáčová, Hasan and Weill (2019) have pointed out their influence on trust in banks. *Television*, *Newspaper, Internet* are dummy variables equal to one if the individual gets information via respectively television, newspaper, or internet on a daily basis.

We add country control variables in the estimations to account for cross-country differences following previous cross-country literature on trust in banks (Fungáčová, Hasan and Weill, 2019). We define GDP per capita as the log of the gross domestic product divided by mid-year population in thousands of current US dollars from the World Development Indicators, to control for the level of income in the country. Bank concentration corresponds to the assets of five largest banks as a share of total commercial banking assets in percent, from the Global Financial Database. It takes into consideration the banking structure in the country: with higher bank concentration, banks can charge higher prices which can reduce access to credit deteriorate trust in banks. Similarly to Inflation, the mean of the three years before the survey year has been reported for GDP per capita and Bank concentration for more reliability, such as in previous studies (Fungáčová, Hasan and Weill, 2019). We take into account the presence of an explicit deposit insurance scheme with the dummy variable *Deposit insurance* equal to one if there is an explicit deposit insurance scheme in the country of the respondent and to zero otherwise, based on the Deposit Insurance Database (Demirgüç-Kunt, Kane and Laeven, 2014). Previous literature suggests that a deposit insurance scheme can mitigate the negative effect of high inflation expectations on the perceived safety of deposits (Prean and Stix, 2011). Therefore, such insurance schemes may reinforce trust in banks since they aim to reduce the depositors' losses in case of bank failures. Finally, we account for the occurrence of a financial crisis with Financial crisis, a dummy variable equal to one in case of a financial crisis in the country of the individual during the five years before the survey year and to zero otherwise. We obtain information on financial crises from the Systemic Crisis Database II (Laeven and Valencia, 2020).

The appendix summarizes the definitions and sources of all variables. Table 1.1 reports the descriptive statistics for all variables. The correlation coefficients of the variables are displayed in Table 1.2.

#### 1.3. Results

This section displays the results for the effect of inflation on trust in banks. We first report the main estimations by considering the influence of recent inflation, then displaying the influence of mean inflation experienced during the lifetime. We further perform a comparison of the impact of recent inflation and mean inflation.

#### 1.3.1. Recent inflation

We investigate whether recent inflation experienced by the individual influences trust in banks. To this end, we perform four estimations to consider two alternative definitions of inflation and two different sets of control variables so that we test the sensitivity of the results. Table 1.3 reports the estimations. We consider *Inflation* in columns (1) and (2), *Log inflation* in columns (3) and (4). We add country control variables in columns (2) and (4).

We find that the coefficients of *Inflation* and *Log inflation* are all significantly negative. This brings evidence of a detrimental influence of current inflation on trust in banks. Living recent inflation hinders trust in banks of individuals. This supports the view that individuals consider current inflation in their approach to banks. They are less prone to deal with banks when experiencing inflation.

By analyzing the control variables, we notice that the coefficients of *Female* are positive and significant implying that women trust banks more than men. The coefficients of *Age* being significantly negative mean that older people tend to trust banks less. The coefficients of *Income* are significantly positive, which supports the view that people trust banks more when they have a higher income. The coefficients of *Education* are significant and negative: individuals with higher education trust banks less. The coefficients of *General trust* are significantly positive, suggesting that when people are trustful towards others, they are likely to trust banks more. These results are all in accordance with cross-country literature on the determinants of trust in banks (Fungáčová, Hasan and Weill, 2019; Fungáčová, Kerola and Weill, 2022). The marital status (*Married*) has no impact. Regarding country variables, the coefficients of *GDP per capita* and *Deposit insurance* are significant and positive outlining that a higher level of income in the country and the presence of an explicit deposit insurance scheme favors trust in banks. On the contrary, the higher the bank concentration the lower the level of trust. Finally, the coefficients of *Financial crisis* are not significant. The effects of this variable are absorbed by the presence of year fixed effects. <sup>12</sup>

<sup>&</sup>lt;sup>12</sup> *Financial crisis* is significantly negative in all estimations performed without year fixed effects. We can thus conclude that the inclusion of year fixed effects leads to the lack of significance of *Financial crisis*, since they absorb the effect of the Global Financial Crisis during the period of our study. The results of estimations without year fixed effects are available upon request.

Our work has so far provided evidence of the statistical significance of the effect of recent inflation on trust in banks. We complement our analysis by examining the economic significance of the results. To this end, we compute the marginal effects of *Inflation* in the specification with the full set of control variables. The coefficients are reported in the first two columns in Table 1.8. Marginal effects indicate the magnitude of the effect of *Inflation* as a percentage point change in probability of falling within a certain outcome category for a change of one-standard deviation in *Inflation*. For more clarity, we only present the marginal effects for a positive trust in banks coded 3 ("quite a lot") and 4 ("a great deal"). We observe that if an individual experiments an increase by 1% in recent inflation, it decreases the probability of a response in category 3 by 0.075 percentage point and in category 4 by 0.116 percentage point. In other words, if recent inflation increases by 1%, the probability that a respondent trusts banks decreases by 0.181 percentage point in total. An increase in 1% of inflation damages more the probability to have a great deal of confidence in banks.

#### 1.3.2. Mean inflation

As experiencing current inflation hampers confidence in banks, past experience of inflation can also have an impact. Since individuals are affected by the experience of inflation in the long term (Malmendier and Nagel, 2016), older inflation experiences can affect trust. We hence consider the influence of the whole experience of inflation throughout life with the variable *Mean inflation*. Table 1.4 lays out the regressions testing the influence of the mean inflation on trust in banks. We use the same four specifications than in Table 1.3.

We observe that the coefficients of *Mean inflation* and *Log mean inflation* are all significantly negative. This supports the view that past experience of inflation hampers trust in banks. The mean inflation experienced throughout life affects confidence in banks, meaning that past inflation has a lasting detrimental effect on trust in banks. We can explain this finding by the fact that individuals reckon with past experienced inflation when considering trust in banks and in extension when dealing with financial decisions. People who have experienced inflation could have seen their savings losing value from inflation or could have had difficulties to obtain a loan at the bank because of higher loan rates resulting from inflation. This could have hindered their trust in banks in the long run and discouraged them to place savings or ask for credit at the bank in the future. For the rest, we find similar results for the control variables when explaining mean inflation than when explaining recent inflation in the former estimations.

We explore the economic significance of the results for the mean inflation experienced over the lifetime by computing the marginal effects of *Mean inflation* in the specification with the full set of control variables in column (2) of Table 1.4. Marginal effects correspond to the magnitude of the effect as a percentage point change of falling within categories 3 or 4 of *Trust in banks* (positive trust for more facility) for a change of one standard deviation in *Mean inflation*. The third and fourth columns of Table 1.8 display the coefficients. They are significantly negative and suggest that when the mean inflation experienced by an individual increases by 1%, the probability that the individual trusts banks "quite a lot" decreases by 0.009 percentage point. Overall, the probability that an individual trusts banks shrinks by 0.022 percentage point when the mean inflation experienced in the lifetime increases by 1%.

We further investigate the influence of experienced mean inflation during the lifetime of the individual by testing whether inflation experienced at different ages plays the same role.

Preferences of individuals can be more affected by inflation at certain periods of their life. For instance, trust in banks for individuals with higher wealth can be more hampered by inflation, since inflation erodes the nominal value of savings, which could lead to greater sensitivity to inflation for older people. Symmetrically, a high inflation in the early years of life can affect more trust in banks if inflation has led to financial difficulties for the parents of the individual.

To this end, we consider different age groups. These groups are defined using a period of 10 (narrow age brackets) and 20 (broad age brackets) years. The tested age group variables are equal to the values of the mean inflation experienced by the individual when belonging to this age group. We perform estimations respectively with narrow age brackets and broad age brackets in Tables 1.5 and 1.6. We consider the specification with mean inflation and all controls in all estimations.

For the narrow age brackets, we observe that coefficients of all age group variables are significantly negative until 60 years old. Estimations for the broad age brackets corroborate this finding: all coefficients for age group variables are again significant and negative until 60 years old. These results support the view that inflation influences trust in banks at all stages in life with the exception of older ages. They reveal the long-lasting effect of inflation on trust in banks. Having lived inflation even at an early age has a long-term detrimental impact on trust in banks. It can be explained by the reminder of living restrictions in the childhood driven by inflation.

#### 1.3.3. Recent versus mean inflation

Now that we have found evidence that recent inflation and mean inflation experienced during the lifetime hinder trust in banks, a natural question that emerges is to compare their impact. We thence redo our estimations by including jointly both inflation variables. The correlation coefficients are not too high between both inflation variables: 0.169 between *Inflation* and *Mean Inflation*, 0.257 between *Log inflation* and *Log mean inflation*.

Table 1.7 reports the estimations. Columns (1) and (2) present the estimations comprising *Inflation* and *Mean inflation*, while columns (3) and (4) display the estimations with *Log inflation* and *Log mean inflation*. Columns (2) and (4) add country control variables to the set of explaining variables.

We first observe that the coefficients for *Inflation* and *Mean inflation* are still all significantly negative. The joint inclusion of both variables does not affect the statistical significance of each variable.

We further examine which variable has the highest effect. We observe that the coefficient for inflation is higher in absolute value than the coefficient for mean inflation in all estimations, suggesting a greater impact of recent inflation. We perform a chi-squared test to check whether this difference is significant. The chi-squared is significantly positive in all estimations. We therefore conclude that recent inflation has a more detrimental impact on trust in banks than the mean inflation experienced during the lifetime.

Even if inflation experienced in life affects trust in banks, recent lived inflation erodes more confidence in the banking system. This finding stresses the importance of fighting against current inflation to favor trust in banks, since the impact of inflation is not mainly driven by past inflation.

We examine the economic significance of the results. For this purpose, we compute the marginal effects of the specification in column (2) with *Inflation* and *Mean inflation* including all control variables. Table 1.8 reports the coefficients of marginal effects in columns (5) and (6). It represents the change in percentage point of the probability falling into the categories 3 and 4 of trust in banks for a change of one standard deviation of *Inflation* and *Mean inflation*. Marginal effects of *Inflation* and *Mean inflation* are very close from what we found above when considering separately each variable. Thus, they corroborate the previous conclusions on the economic significance of the impact of inflation.

#### **1.4. Additional estimations**

After having pointed out the impacts of both recent and long-term experienced inflation on trust in banks, we further investigate the influence of individual determinants on these effects. We first consider sociodemographic determinants, then turn to information channels. We finally test the influence of inflation on the difference between trust in banks and trust in institutions.

#### 1.4.1. Sociodemographic determinants

We question whether the influence of inflation on trust in banks is conditional to sociodemographic determinants. Namely, we want to know whether income, education, and gender, affect the negative impact of inflation.

Regarding income and education, there is a bunch of evidence showing that low-income households and less educated people tend to overestimate inflation (Bryan and Venkatu, 2001; Christensen, van Els, and van Rooij, 2006). As a consequence, we test the hypothesis that inflation has a greater impact on trust in banks for individuals with lower income and education.

However, we can propose two counterarguments. On the one hand, the negative impact of inflation can be stronger for individuals with high income since inflation can be more detrimental for them. High-income individuals devote a larger share of their income to savings, and as such the eroding impact of inflation on savings is more devastating for them. On the other hand, more educated people are likely to have greater financial literacy. Van der Cruijsen, de Haan and Roerink (2021) show evidence that individuals with greater financial knowledge are more likely to trust banks. As such, they can have a better understanding of the inflation mechanisms and its generated losses, deteriorating their trust in banks in times of inflation. Thus, we also test the hypothesis that trust in banks of respondents with higher income or higher education is more negatively impacted by inflation.

Regarding gender, we test the hypothesis that inflation would have a higher impact on women. We base this hypothesis on the empirical conclusion that women are more exposed to price signals than men (D'Acunto et al., 2021). This gender gap is explained by the traditional gender roles leading to greater participation in grocery shopping and higher frequency of buying for women (Georganas, Healy, and Li, 2014; D'Acunto, Malmendier and Weber, 2021).

We test these hypotheses by comparing the effect of inflation between the categories of the three sociodemographic variables (*Income, Education,* and *Female*). For more simplicity,

we turn *Income* into a dummy variable taking one whether the individual has high income (values of reported income between 6 and 10), and 0 otherwise. We consider the specification including all control variables including country controls and we alternatively consider *Inflation* and *Mean inflation* as the inflation variable. We perform chi-squared tests to compare the effects of *Inflation* and *Mean inflation* on trust in banks between the two categories of each dummy variable, in order to conclude whether the sociodemographic factor influences the relationship between inflation and trust in banks.

Table 1.9 reports the estimations with recent inflation.

We find that the influence of recent inflation on trust in banks significantly differs with the level of education and the gender. Coefficients of *Inflation* are significantly negative for educated people but not significant for low-educated people. Therefore, recent inflation only deteriorates trust in banks for educated people. Coefficients of *Inflation* are significantly negative for men and women. However, the chi-squared test shows that the effect is higher in absolute terms for men, supporting the view that the confidence in banks of males is more impacted by recent inflation. For income, we observe a significant and negative coefficient for *Inflation* for both categories of income, which is not significantly different with the chi-squared test.

Table 1.10 displays the estimations with mean inflation experienced during the lifetime. We find again that the coefficients for *Inflation* are significantly negative for educated people but not significant for low-educated people. This finding ascertains the previous results and suggests that mean inflation affects more trust in banks for individuals with higher education. For the rest, while the coefficient of *Inflation* is significantly negative for both categories of income and for both genders, we do not observe any significant chi-squared for *Income* and *Female*, suggesting no impact of income or gender on the relation between mean inflation experienced during the lifetime and trust in banks.

To sum it up, we find evidence that some sociodemographic characteristics affect the relation between inflation and trust in banks. In particular, we show that education exerts an influence on this relation: both recent and mean experienced inflation deteriorates more the confidence in banks of educated people, which can result from greater perception of inflation when individuals are more educated.

#### 1.4.2. Access to information

Former literature has shown the impact of the media used daily on trust in banks. In their cross-country analysis of the determinants of trust in banks, Fungáčová, Hasan and Weill (2019) find that daily access to television increases trust in banks whereas daily access to internet deteriorates trust in banks, while evidence is mixed for daily access to newspaper.

These results can be explained by the differences in the type of news spread through the information channels. Authorities can have a stronger influence on television and newspapers, in particular in autocratic countries but also in democracies through statecontrolled television channels. Reversely, lower regulation of news on internet makes it more open to uncontrolled information. As well, the different media can provide more or less editorial contents about inflation depending on their audience. Reading newspapers can also be associated with higher education of the audience, which can thus lead to a similar influence of reading newspaper than for education on the relation between inflation and trust in banks.

Inflation can thus have a different influence on individuals based on the way they get news. On the one hand, television channels and newspapers can be more controlled than internet to moderate the negative news about inflation. Jansen et al. (2015) provide evidence that negative media reports affect trust in banks. On the other hand, they can also stress more or less inflation based on editorial choices to attract audience.

We redo the regressions by comparing the effects of *Inflation* between the categories of the three variables measuring the daily use of the media to have information (*Television, Newspaper, Internet*). We perform the estimations with all control variables. We only consider recent inflation in these estimations since we have only information for the type of media used by the individual at the time of the interview. We are not aware of the way the individual used to get information in her/his former years, so it is meaningless to investigate the impact of the current information channels on the relation between mean inflation during the lifetime and trust in banks.

Table 1.11 lays out the estimations. We observe that coefficients for *Inflation* are significantly negative in all estimations. We find that chi-squared for *Television* and *Internet* are not significant, while being significant for *Newspaper*. Therefore, we conclude that having a daily access to television or internet does not influence how recent inflation affects trust in banks. They neither amplify, nor moderate the impact of inflation on trust in banks. However, having a daily access to newspaper exacerbates the detrimental impact of inflation on trust in banks. Reading newspaper can thus have an amplifying effect on the influence of inflation on trust in banks. It suggests that newspapers do not have a soothing effect on the influence of inflation on trust in banks, which could have been the case through state influence on newspapers. It may be the outcome of higher education of newspaper readers, which leads to a

similar impact of having access to information through newspapers than for education on the relation between inflation and trust in banks.

#### 1.4.3. Explaining relative trust in banks with inflation

We deepen our study by investigating whether recent and mean experienced inflation explains the difference in trust between banks and all institutions in general. We can indeed question whether inflation deteriorates trust in banks in particular or rather has a broader detrimental impact on trust in all institutions.

To this end, we create the variable *Relative trust in banks* as the difference between *Trust in banks* and *Trust in courts.*, following Fungáčová, Hasan and Weill, (2019). *Trust in courts* is a relevant proxy for trust in institutions in general, since courts guarantee the enforcement of the law, and are key in the preservation of the quality of institutions. *Trust in courts* is based on the answers to the following question and has been recoded in the same manner as *Trust in banks*:

"Could you tell me how much confidence you have in courts: is it a great deal of confidence (1), quite a lot of confidence (2), not very much confidence (3) or none at all (4)?"

We redo our estimations with *Relative trust in banks* as the dependent variable. We aim at checking whether inflation has the same effect on trust in banks and relative trust in banks. If the impact of inflation on trust in banks ceases to be negative when explaining relative trust in banks, it would indicate that inflation has an impact on trust in institutions in general but not specifically on trust in banks. In contrast, the finding of a negative impact of inflation on relative trust in banks would support the conclusion that inflation has a specific negative influence on trust in banks. Table 1.12 lays out the estimations.

We observe a significantly negative coefficient for recent inflation and past inflation in all estimations. We therefore conclude that inflation has a specific detrimental impact on trust in banks. Experience of greater inflation in the lifetime or in the recent years does not have a negative influence on trust in banks by affecting trust in all institutions. It specifically erodes trust in banks. We also notice significant and negative coefficients for *Financial crisis*, meaning that a financial crisis in the country deteriorates trust in banks in comparison to trust in institutions.

#### **1.5.** Conclusion

In this paper, we investigate whether inflation influences trust in banks in a crosscountry analysis. Our evidence overwhelmingly supports the view that inflation impairs trust in banks. Both recent inflation and mean inflation experienced during the lifetime exert a negative impact on trust in banks. We explain these findings by the detrimental influence of inflation on the value of savings and credit conditions, raising distrust towards banks.

We further find that recent inflation is significantly more detrimental than mean inflation throughout life on trust in banks. Moreover, inflation experienced at all ages, with the exception of inflation experienced after 60 years, affects negatively trust in banks. Our conclusion is therefore that inflation exerts a short-term and a long-term impact on trust in banks. Even if the short-term effect is stronger, the effects of past inflation persistently hamper trust in banks.

Additional findings show that the influence of inflation on trust in banks is affected by some individual characteristics. Education influences this relation: recent and past inflation has a greater impact on educated individuals. Inflation recently experienced also affects individuals with a daily access to newspaper. We also find that inflation exerts a distinctive impact on trust in banks relative to trust in institutions. We can thus point out that the detrimental effect of inflation on trust in banks varies across individuals.

However, our study encounters some limitations related to our dataset. It does not include some variables which could be relevant for our research question such as financial literacy, which impacts trust in banks (van der Cruijsen, de Haan and Roerink, 2021), and perceived inflation, which can affect trust in central banks (van der Cruijsen, de Haan and van Rooij, 2023). These limits suggest directions for further research.

Our work helps understanding the within-country and cross-country differences in trust in banks observed worldwide. They are driven by current inflation but also by different experiences of inflation of individuals throughout life. The overall implications of our study are that fighting inflation contributes to the confidence in the banking system and thus favors financial development through this channel. Evidence stresses short-term but also long-term detrimental effects of inflation, increasing the importance of this cost of inflation.

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#### Tables

# Table 1.1.Descriptive statistics

This table reports the descriptive statistics for the variables employed in this study.

Variable	Observations	Mean	Std. dev.	Min	Max
Trust in banks	143,114	2.583	0.934	1	4
Relative trust in banks	140,132	0.017	1.046	-3	3
Female	143,114	0.517	0.500	0	1
Age	143,114	41.824	16.190	16	103
Married	143,114	0.564	0.496	0	1
Education	143,114	0.717	0.450	0	1
Income	143,114	4.841	2.105	1	10
General trust	143,114	0.237	0.425	0	1
GDP per capita	143,114	8.924	1.213	6.429	11.298
Bank concentration	143,114	75.679	17.252	35.024	100
Financial crisis	143,114	0.176	0.381	0	1
Deposit insurance	143,114	0.843	0.364	0	1
Inflation	143,114	5.825	8.716	-1.291	88.939
Log inflation	143,114	0.054	0.066	-0.013	0.636
Mean inflation	143,114	37.914	77.298	0.084	487.167
Log mean inflation	143,114	0.234	0.362	0.001	1.770
Newspaper	139,399	0.251	0.434	0	1
Television	139,677	0.680	0.466	0	1
Internet	138,576	0.387	0.487	0	1

# Table 1.2.Correlation matrix

This table reports the correlation coefficients of the variables employed in this study.

	Trust in banks	Relative trust in banks	Inflation	Log inflation	Mean inflation	Log mean inflation	Female	Age	Married
Relative trust in banks	0.551								
Inflation	0.020	0.038							
Log inflation	0.029	0.050	0.992						
Mean inflation	-0.101	0.066	0.169	0.197					
Log mean inflation	-0.110	0.070	0.226	0.257	0.981				
Female	0.010	0.006	-0.003	-0.003	0.031	0.034			
Age	-0.061	-0.076	-0.083	-0.098	0.063	0.071	-0.008		
Married	0.061	-0.028	0.017	0.018	-0.033	-0.023	-0.017	0.261	
Education	-0.047	-0.021	-0.034	-0.047	0.040	0.042	-0.032	-0.143	-0.058
Income	0.054	-0.019	-0.069	-0.068	-0.054	-0.059	-0.026	-0.091	0.034
General trust	0.040	-0.087	-0.088	-0.097	-0.081	-0.095	-0.015	0.089	0.038
GDP per capita	-0.139	-0.218	-0.341	-0.385	-0.094	-0.121	0.004	0.230	-0.044
Bank concentration	-0.105	-0.041	-0.064	-0.073	-0.013	-0.052	-0.003	-0.015	-0.124
Financial crisis	-0.076	-0.028	0.082	0.112	0.197	0.244	0.015	0.036	-0.053
Deposit insurance	-0.054	0.014	-0.081	-0.108	0.132	0.129	0.012	0.096	-0.024
Newspaper	0.027	-0.059	-0.086	-0.095	-0.042	-0.062	-0.082	0.146	0.051
Television	0.029	-0.022	-0.074	-0.068	0.080	0.086	-0.010	0.188	0.090
Internet	-0.040	-0.058	-0.123	-0.141	-0.056	-0.072	-0.048	-0.171	-0.093

	Education	Income	General trust	GDP per capita	Bank concentration	Financial crisis	Deposit insurance	Newspaper	Television
Income	0.176								
General trust	0.073	0.084							
GDP per capita	0.193	0.092	0.214						
Bank concentration	0.001	0.078	0.033	0.167					
Financial crisis	0.056	0.006	0.054	0.113	-0.117				
Deposit insurance	0.118	-0.021	-0.003	0.188	-0.254	0.106			
Newspaper	0.082	0.123	0.089	0.220	0.048	0.013	0.056		
Television	0.034	0.028	-0.024	0.083	-0.025	-0.002	0.021	0.214	
Internet	0.288	0.176	0.068	0.283	0.053	0.021	0.103	0.134	0.052

### Table 1.3.Recent inflation

This table presents ordered logit regressions. The dependent variable is the ordinal variable *Trust in banks*. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1% and 0.1% level, respectively. Definitions of variables are provided in the Appendix.

	(1)	(2)	(3)	(4)
Inflation	-0.010***	-0.009***		
	(0.001)	(0.001)		
Log inflation			-1.346***	-1.079***
			(0.132)	(0.133)
Female	0.076***	0.075***	0.076***	0.075***
	(0.010)	(0.010)	(0.010)	(0.010)
Age	-0.001**	-0.001**	-0.001**	-0.001**
	(3.5e-4)	(3.5e-4)	(3.5e-4)	(3.5e-4)
Married	-0.010	-0.013	-0.011	-0.013
	(0.011)	(0.011)	(0.011)	(0.011)
Income	0.057***	0.058***	0.057***	0.058***
	(0.003)	(0.003)	(0.003)	(0.003)
Education	-0.092***	-0.089***	-0.092***	-0.089***
	(0.013)	(0.013)	(0.013)	(0.013)
General trust	0.203***	0.202***	0.203***	0.202***
	(0.013)	(0.013)	(0.013)	(0.013)
GDP per capita		0.155***		0.154***
		(0.032)		(0.032)
Deposit insurance		0.398***		0.397***
		(0.056)		(0.056)
Bank concentration		-0.008***		-0.008***
		(0.001)		(0.001)
Financial crisis		0.060		0.066
		(0.037)		(0.037)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Observations	143114	143114	143114	143114
Pseudo R-squared	0.074	0.075	0.074	0.075

### Table 1.4.Mean inflation

This table presents ordered logit regressions. The dependent variable is the ordinal variable *Trust in banks*. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1% and 0.1% level, respectively. Definitions of variables are provided in the Appendix.

	(1)	(2)	(3)	(4)
Mean inflation	-0.001***	-0.001***		
	(1.6e-4)	(1.6e-4)		
Log mean inflation			-0.275***	-0.291***
			(0.037)	(0.037)
Female	0.078***	0.076***	0.078***	0.076***
	(0.010)	(0.010)	(0.010)	(0.010)
Age	-0.001*	-0.001*	-0.001	-0.001
	(3.5e-4)	(3.5e-4)	(3.5e-4)	(3.5e-4)
Married	-0.009	-0.011	-0.007	-0.01
	(0.011)	(0.011)	(0.011)	(0.011)
Income	0.057***	0.059***	0.057***	0.058***
	(0.003)	(0.003)	(0.003)	(0.003)
Education	-0.088***	-0.086***	-0.088***	-0.086***
	(0.013)	(0.013)	(0.013)	(0.013)
General trust	0.202***	0.201***	0.202***	0.201***
	(0.013)	(0.013)	(0.013)	(0.013)
GDP per capita		0.188***		0.189***
		(0.032)		(0.032)
Deposit insurance		0.408***		0.406***
		(0.056)		(0.056)
Bank concentration		-0.009***		-0.009***
		(0.001)		(0.001)
Financial crisis		0.032		0.033
		(0.037)		(0.037)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Observations	143114	143114	143114	143114
Pseudo R-squared	0.074	0.075	0.074	0.075

## Table 1.5.Inflation during lifetime (10-years period)

This table presents ordered logit regressions. The dependent variable is the ordinal variable *Trust in banks*. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 5%, 1% and 0.1% level, respectively. Definitions of variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mean inflation [0-10] years old	-8.6e-5*						
	(3.4e-5)						
Mean inflation]10-20] years old		-8.2e-5*					
		(3.3e-5)					
Mean inflation]20-30] years old			-1.2e-4***				
			(3.2e-5)				
Mean inflation]30-40] years old				-7.6e-5*			
				(3.5e-5)			
Mean inflation]40-50] years old					-2.2e-4***		
					(5.2e-5)		
Mean inflation]50-60] years old						-1.6e-4*	
						(6.7e-5)	0.001
Mean inflation after 60 years old							-0.001
	0.0(3+++	0 075***	0.070***	0 001***	0 100***	0 1 4 2 * * *	(4.9e-4)
Female	$0.062^{***}$	$0.0/5^{***}$	$0.0/9^{***}$	$0.091^{***}$	$0.109^{***}$	$0.142^{***}$	$0.151^{***}$
<b>A</b> = -	(0.012)	(0.011)	(0.011)	(0.012)	(0.015)	(0.019)	(0.027)
Age	$-0.004^{***}$	$-0.002^{+++}$	(4.4, 4)	$0.004^{***}$	$0.006^{***}$	$0.011^{***}$	$0.021^{****}$
Married	(0.001)	(4.6e-4)	(4.46-4)	(0.001) 0.024*	(0.001)	(0.001)	(0.002)
Manied	(0.011)	-0.003	(0.011)	(0.034)	(0.024)	(0.038)	(0.033)
Income	(0.015)	(0.012)	(0.012)	(0.014)	(0.017)	(0.021)	(0.028)
Income	(0.031)	(0.033)	(0.033)	(0.038)	(0.002)	(0.001)	$(0.000^{-1.1})$
Education	(0.003)	(0.005)	(0.003)	(0.005)	(0.004)	(0.003)	(0.007)
	-0.0/1	-0.077200	-0.072	$-0.000^{-0.000}$	-0.113	-0.093	$-0.078^{\circ}$
	(0.013)	(0.014)	(0.014)	(0.010)	(0.019)	(0.023)	(0.052)
General trust	0.193***	0.211***	0.210***	0.226***	0.234***	0.244***	0.257***
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	(0.015)	(0.014)	(0.014)	(0.015)	(0.018)	(0.022)	(0.031)
GDP per capita	0.254***	0.231***	0.191***	0.144***	0.152***	0.081	0.046
	(0.037)	(0.034)	(0.034)	(0.037)	(0.042)	(0.050)	(0.070)
Deposit insurance	0.271***	0.289***	0.341***	0.308***	0.135	0.193	0.102
-	(0.070)	(0.063)	(0.063)	(0.072)	(0.087)	(0.114)	(0.176)
Bank concentration	-0.013***	-0.012***	-0.010***	-0.010***	-0.012***	-0.009***	-0.010*
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)
Financial crisis	0.057	0.032	0.024	0.045	0.075	0.101	0.123
	(0.046)	(0.042)	(0.041)	(0.045)	(0.051)	(0.062)	(0.092)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	102595	119118	120285	93185	66251	42262	21708
Pseudo R-squared	0.077	0.077	0.077	0.081	0.084	0.083	0.084

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## Table 1.6.Inflation during lifetime (20-years period)

	(1)	(2)	(3)	(4)
Mean inflation [0-20] years old	-1.1e-4**			
	(4.1e-5)			
Mean inflation]20-40] years old		-1.2e-4**		
		(3.7e-5)		
Mean inflation]40-60] years old			-2.6e-4***	
			(6.6e-5)	
Mean inflation after 60 years old				-0.001
				(4.9e-4)
Female	0.075***	0.080***	0.112***	0.151***
	(0.011)	(0.010)	(0.015)	(0.027)
Age	-0.002***	0.001**	0.006***	0.021***
	(4.5e-4)	(4.1e-4)	(0.001)	(0.002)
Married	-0.003	0.004	0.029	0.035
	(0.012)	(0.012)	(0.017)	(0.028)
Income	0.053***	0.057***	0.064***	0.060***
	(0.003)	(0.003)	(0.004)	(0.007)
Education	-0.077***	-0.072***	-0.116***	-0.078*
	(0.014)	(0.014)	(0.018)	(0.032)
General trust	0.212***	0.206***	0.233***	0.257***
	(0.014)	(0.013)	(0.018)	(0.031)
GDP per capita	0.231***	0.183***	0.133**	0.046
	(0.034)	(0.033)	(0.041)	(0.07)
Deposit insurance	0.303***	0.375***	0.217*	0.102
	(0.063)	(0.060)	(0.085)	(0.176)
Bank concentration	-0.012***	-0.009***	-0.010***	-0.010*
	(0.001)	(0.001)	(0.002)	(0.004)
Financial crisis	0.028	0.039	0.062	0.123
	(0.042)	(0.039)	(0.050)	(0.092)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Observations	119238	127395	68042	21708
Pseudo R-squared	0.077	0.077	0.083	0.084

### Table 1.7.Recent inflation and mean inflation

	(1)	(2)	(3)	(4)
Inflation	-0.010***	-0.008***		
	(0.001)	(0.001)		
Mean inflation	-0.001***	-0.001***		
	(1.6e-04)	(1.6e-04)		
Log inflation			-1.180***	-0.875***
			(0.135)	(0.137)
Log mean inflation			-0.198***	-0.231***
			(0.038)	(0.038)
Female	0.076***	0.075***	0.076***	0.075***
	(0.010)	(0.010)	(0.010)	(0.010)
Age	-0.001*	-0.001*	-0.001*	-0.001
	(3.5e-4)	(3.5e-4)	(3.5e-4)	(3.5e-4)
Married	-0.009	-0.011	-0.008	-0.010
	(0.011)	(0.011)	(0.011)	(0.011)
Income	0.057***	0.058***	0.057***	0.058***
	(0.003)	(0.003)	(0.003)	(0.003)
Education	-0.091***	-0.089***	-0.091***	-0.088***
	(0.013)	(0.013)	(0.013)	(0.013)
General trust	0.202***	0.201***	0.202***	0.201***
	(0.013)	(0.013)	(0.013)	(0.013)
GDP per capita		0.164***		0.166***
		(0.032)		(0.032)
Deposit insurance		0.397***		0.396***
		(0.056)		(0.056)
Bank concentration		-0.008***		-0.008***
		(0.001)		(0.001)
Financial crisis		0.032		0.038
		(0.037)		(0.037)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Chi-squared	61.14***	36.75***	35.89***	15.06***
Observations	143114	143114	143114	143114
Pseudo R-squared	0.074	0.075	0.074	0.075

#### Table 1.8. Marginal effects

This table provides the marginal effects for the ordered logit models reported in columns (2) in Tables 3, 4 and 7. Marginal effects are presented in percentage points. They are based on a change of one standard deviation. The dependent variable is *Trust in banks*. Marginal effects are presented for *Trust in banks* outcome categories 3 ("quite a lot") and 4 ("a great deal") of confidence. Definition of all variables are presented in the Appendix.

Model specification	Infla	Inflation		Mean Inflation		Inflation and Mean Inflation	
Trust in banks outcome	3	4	3	4	3	4	
Inflation	-0.075***	-0.106***			-0.067***	-0.096***	
Mean Inflation			-0.009***	-0.013***	-0.007***	-0.011***	

# Table 1.9. The influence of sociodemographic variables (recent inflation)

	Income		Educ	Education		Female	
-	0	1	0	1	0	1	
Inflation	-0.009***	-0.010***	-0.003	-0.011***	-0.011***	-0.006***	
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	
Female	0.100***	0.035*	0.058**	0.085***			
	(0.012)	(0.016)	(0.019)	(0.012)			
Age	-0.002***	-0.001	-0.001	-0.002***	-4.5e-4	-0.002***	
	(4.3e-4)	(0.001)	(0.001)	(4.3e-4)	(0.001)	(4.8e-8)	
Married	-0.011	-0.004	-0.022	-0.010	-0.017	-0.003	
	(0.014)	(0.018)	(0.021)	(0.013)	(0.016)	(0.015)	
Income			0.035***	0.068***	0.065***	0.053***	
			(0.005)	(0.003)	(0.004)	(0.004)	
Education	-0.105***	0.004			-0.084***	-0.106***	
	(0.015)	(0.023)			(0.018)	(0.018)	
General trust	0.202***	0.216***	0.146***	0.227***	0.239***	0.166***	
	(0.016)	(0.020)	(0.025)	(0.015)	(0.018)	(0.018)	
Country controls	Yes	Yes	Yes	Yes	Yes	Yes	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	
Chi-squared	0.15		13.35***		4.66*		
Observations	89970	53144	40439	102675	69176	73938	
Pseudo R-squared	0.082	0.063	0.08	0.074	0.079	0.073	

## Table 1.10. The influence of sociodemographic variables (mean inflation)

	Income		Education		Female	
	0	1	0	1	0	1
Mean inflation	-0.001***	-0.001*	-2.7e-4	-0.001***	-0.001***	-0.001***
	(2.0e-4)	(2.7e-4)	(4.3e-4)	(1.8e-4)	(2.3e-4)	(2.2e-4)
Female	0.101***	0.036*	0.058**	0.086***		
	(0.012)	(0.016)	(0.019)	(0.012)		
Age	-0.001**	-4.5e-4	-0.001	-0.001**	-1.2e-4	-0.001**
	(4.3e-4)	(0.001)	(0.001)	(4.3e-4)	(5.2e-4)	(4.9e-4)
Married	-0.008	-0.003	-0.022	-0.008	-0.015	-0.002
	(0.014)	(0.018)	(0.021)	(0.013)	(0.016)	(0.015)
Income			0.035***	0.069***	0.065***	0.053***
			(0.005)	(0.003)	(0.004)	(0.004)
Education	-0.102***	0.007			-0.080***	-0.104***
	(0.015)	(0.023)			(0.018)	(0.018)
General trust	0.200***	0.216***	0.146***	0.226***	0.238***	0.166***
	(0.016)	(0.020)	(0.025)	(0.015)	(0.018)	(0.018)
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Chi-squared	2.93		4.00*		1.27	
Observations	89970	53144	40439	102675	69176	73938
Pseudo R-squared	0.082	0.063	0.08	0.074	0.078	0.073

### Table 1.11.The influence of information channels

	Newspaper		TV		Internet	
	0	1	0	1	0	1
Inflation	-0.006***	-0.020***	-0.007***	-0.011***	-0.008***	-0.012***
	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)
Female	0.085***	0.065**	0.117***	0.053***	0.047***	0.114***
	(0.012)	(0.020)	(0.018)	(0.012)	(0.013)	(0.016)
Age	-0.002***	-2.4e-4	-0.002**	-0.003***	-5.8e-5	-0.004***
	(4.1e-4)	(0.001)	(0.001)	(4.3e-4)	(4.4e-4)	(0.001)
Married	-0.010	-0.029	-0.025	-0.013	-0.020	0.010
	(0.013)	(0.022)	(0.020)	(0.013)	(0.014)	(0.018)
Income	0.056***	0.065***	0.055***	0.059***	0.051***	0.070***
	(0.003)	(0.005)	(0.005)	(0.003)	(0.003)	(0.004)
Education	-0.095***	-0.118***	-0.083***	-0.114***	-0.060***	-0.166***
	(0.015)	(0.027)	(0.024)	(0.016)	(0.015)	(0.028)
General trust	0.186***	0.230***	0.189***	0.216***	0.165***	0.263***
	(0.015)	(0.024)	(0.022)	(0.016)	(0.017)	(0.020)
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Chi-squared	18.54***		3.62		1.91	
Observations	104410	34989	44631	95046	85010	53566
Pseudo R-squared	0.073	0.082	0.076	0.076	0.078	0.068

## Table 1.12.Relative trust in banks

	(1)	(2)	(3)	(4)
Inflation	-0.008***			
	(0.001)			
Log inflation		-1.085***		
		(0.134)		
Mean inflation			-4.0e-4*	
			(1.6e-4)	
Log mean inflation				-0.097*
				(-0.097)
Female	0.027**	0.027**	0.028**	0.028**
	(0.010)	(0.010)	(0.010)	(0.010)
Age	-0.001**	-0.001**	-0.001*	-0.001*
	(3.5e-4)	(3.5e-4)	(3.6e-4)	(3.6e-4)
Married	-0.041***	-0.041***	-0.041***	-0.040***
	(0.011)	(0.011)	(0.011)	(0.011)
Income	0.007**	0.007**	0.008**	0.008**
	(0.003)	(0.003)	(0.003)	(0.003)
Education	0.043***	0.044***	0.046***	0.046***
	(0.013)	(0.013)	(0.013)	(0.013)
General trust	-0.161***	-0.161***	-0.161***	-0.161***
	(0.013)	(0.013)	(0.013)	(0.013)
GDP per capita	0.037	0.035	0.070*	0.070*
	(0.033)	(0.033)	(0.033)	(0.033)
Deposit insurance	0.011	0.012	0.009	0.009
	(0.059)	(0.059)	(0.059)	(0.059)
Bank concentration	-0.005***	-0.005***	-0.006***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)
Financial crisis	-0.130**	-0.126**	-0.113*	-0.111*
	(0.045)	(0.045)	(0.046)	(0.045)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Observations	140132	140132	140132	140132
Pseudo R-squared	0.05	0.05	0.05	0.05

### Appendix

<b>Definitions and</b>	sources	of	variables
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Variable	Description
Dependent variables	
Trust in banks	Ordinal variable with values between 1 and 4, based on response to the question: <i>Could you tell me how much confidence you have in banks?</i> Scoring: <i>None at all</i> (1), <i>Not very much confidence</i> (2), <i>Quite a lot of confidence</i> (3), <i>A great deal of confidence</i> (4). Source: World Values Survey.
Relative trust in banks	Difference between <i>Trust in Banks</i> and <i>Trust in courts</i> , defined as an ordinal variable and based on the response to the question: <i>Could you tell me how much confidence you have in the courts?</i> Scoring: <i>None at all</i> (1), <i>Not very much confidence</i> (2), <i>Quite a lot of confidence</i> (3), <i>A great deal of confidence</i> (4). Source: World Values Survey.
Independent variables	
Female	Dummy variable equal to 1 if the individual is a female, and 0 if the individual is a male (by observation, not self-reported). Source: World Values Survey.
Age	Age in number of years. Source: World Values Survey.
Married	Dummy variable equal to 1 if the individual is married, and 0 otherwise. Source: World Values Survey.
Education	Dummy variable equal to 1 if the individual has secondary or tertiary education, and 0 otherwise. Source: World Values Survey.
Income	Self-reported level of income of the respondent to his country, based on the question: On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in. The figure reported ranges from 1 for lowest decile to 10 for the highest income decile. Source: World Values Survey.
General trust	Dummy variable based on response to the question: <i>Generally speaking,</i> <i>would you say that most people can be trusted or that you need to be very</i> <i>careful in dealing with people?</i> Scoring: <i>Need to be very careful</i> (0), <i>Most</i> <i>people can be trusted</i> (1). Source: World Values Survey.
GDP per capita	Log of gross domestic product divided by mid-year population in thousands of current US dollars. The mean of three years before the survey year has been used. Source: World Development Indicators.

Bank concentration	Assets of five largest banks as a share of total commercial banking assets, in percent. The mean of three years before the survey year in each country has been used. The most recent observation has been used when data was unavailable. Source: Global Financial Development Database. For Iran, the most recent data (2010) has been used and comes from the Federal Reserve Bank of St. Louis. For Maldives, data come from the Humaniterian Data Exchange.
Financial crisis	Dummy variable equal to 1 if there has been at least one financial crisis (systemic banking crisis, currency crisis or sovereign debt crisis) in the country of the individual during the five years before the survey year, and 0 otherwise. Source: Systemic Banking Crises Database II (Laeven and Valencia, 2020). No financial crises have been identified for Iraq and Qatar.
Deposit insurance	Dummy variable equal to 1 if there is an explicit deposit insurance in the country, and 0 otherwise. Source: Deposit Insurance Database (Demirgüç-Kunt, Kane, and Laeven, 2014). Observations have been updated for Bolivia, China, Haïti, Maldives, Pakistan and Tunisia.
Inflation	Inflation is measured by the consumer price index (annual percentage change in the cost to the average consumer of acquiring a basket of goods and services). The mean of three years before the survey year has been used. Source: World Development Indicators.
Log inflation	Log of 1 added to the <i>Inflation</i> rate.
Mean inflation	Mean of the percentage rate of <i>Inflation</i> during the lifetime of the individual. Inflation comes from the World Development Indicators.
Log mean inflation	Log of 1 added to the Mean inflation rate.
Newspaper	Dummy variable equal to 1 if the individual use newspapers on a daily basis to obtain information, and 0 otherwise. Source: World Values Survey.
Television	Dummy variable equal to 1 if the individual use television on a daily basis to obtain information, and 0 otherwise. Source: World Values Survey.
Internet	Dummy variable equal to 1 if the individual use internet on a daily basis to obtain information, and 0 otherwise. Source: World Values Survey.

### Chapter 2<sup>13</sup>

### Trust in Banks and Financial Inclusion: Micro-Level Evidence from 28 Countries

#### Abstract

This paper examines the impact of trust in banks on financial inclusion in a cross-country framework. We use micro-level data informing on trust in banks and financial inclusion for a dataset of about 61,000 observations from 28 countries. We find evidence of the positive impact of trust in banks on financial inclusion. We find that the positive impact of trust in banks on financial inclusion. We find that the positive impact of trust in banks on financial inclusion affects all individuals, regardless of their socio-demographic characteristics and of their financial situation, and is not conditional to the country or the year. Overall, we provide support to enhance trust in banks in the perspective of promoting financial inclusion worldwide.

**JEL Codes**: D14 • G21 • O16

Keywords: trust in banks • financial inclusion • banking

<sup>&</sup>lt;sup>13</sup> This chapter is co-written with Laurent Weill and has been published in *Economics Systems* (2024).

#### 2.1. Introduction

A common concern during financial crises is the loss of trust in banks. The Global Financial Crisis was no exception, as authorities sought to maintain confidence in banks through various means including reassuring commitments and measures of support for the banking industry.

But why should we care about trust in banks? Two reasons are generally given to motivate the willingness to preserve confidence in banks. The first relates to financial stability through the need to avoid bank runs. A decline in trust in banks can lead to massive withdrawals of deposits, which can affect the stability of the banking system. Empirical evidence showing the influence of trust in banks on financial stability supports this concern (e.g., Guiso, 2010; Chernykh, Davydov and Sihvonen, 2019).

The second is the positive impact of trust in banks on financial inclusion. In the broader definition, financial inclusion refers to the fact that a person owns an account in a bank. This allows the person to access financial services, such as saving and borrowing money. Financial inclusion has become an important part of the development agenda over the past decade (Sahay et al., 2015; Demirgüc-Kunt, Klapper and Singer, 2017), as it has been identified as a tool to reduce poverty and improve household welfare (Demirgüc-Kunt and Klapper, 2012; Dupas and Robinson, 2013). Therefore, a common argument is that greater trust in banks can promote financial inclusion by motivating individuals to deposit their savings and apply for a loan at a bank. As a result, trust in banks would be an important driver of financial inclusion.

However, evidence on the impact of trust in banks on financial inclusion remains limited. We are aware of only three single-country studies that examine this question: Ampudia and Palligkinis (2018) for Italy, Ghosh (2021) for India, and Koomson, Koomson and Abdul-Mumuni (2023) for Ghana. All three papers find evidence of the positive impact of trust in banks on financial inclusion.

The objective of this paper is to provide the first cross-country study of the impact of trust in banks on financial inclusion. A cross-country approach allows for broader generalization of the results, as a single country may be an outlier. Moreover, previous evidence has shown the influence of country characteristics such as institutional quality on financial inclusion (e.g., Zeqiraj, Sohag and Hammoudeh, 2022). Therefore, it seems important to investigate the relationship between trust in banks and financial inclusion by analyzing several

countries. Finally, a cross-country approach provides a greater variety of data to assess the impact of trust in banks on financial inclusion.

While the argument that trust in banks encourages individuals to use banking services is intuitive, the empirical finding of a positive impact of trust in banks on financial inclusion is far from obvious. On the one hand, trust in banks may be insignificant in influencing financial inclusion if individuals do not care about this dimension. The literature on the determinants of financial inclusion has shown the influence of many factors including individual-level characteristics such as gender or age (Fungáčová, Hasan and Weill, 2019) and country-level characteristics such as inflation (Heyert and Weill, 2024) or general trust (Xu, 2020). Trust in banks may be insignificant in explaining financial inclusion relative to these other determinants. On the other hand, Fungáčová, Hasan and Weill (2019) find the intriguing result that trust in banks is the lowest in the world in developed countries, which are also the countries with the highest levels of financial inclusion. Individuals may be financially included without trusting banks, because the use of financial services can facilitate their daily life and can be necessary to make transactions. In other words, low trust in banks can coexist with high financial inclusion, raising questions about the expected positive impact of trust in banks on financial inclusion.

To perform our investigation, we use the data from the Life in Transition Survey (LiTS) conducted by the European Bank for Reconstruction and Development in 2006, 2010 and 2016. This survey provides micro-level data on both trust in banks and financial inclusion, allowing for perfect identification between these two variables. Our sample contains about 61,000 observations from 28 countries located in Central and Eastern Europe and Central Asia. It thus provides a unique and large cross-country dataset for analyzing the impact of trust in banks on financial inclusion at the individual level. In terms of country coverage, the dataset has the advantage of covering countries with very different levels in trust in banks (Fungáčová, Hasan and Weill, 2019), in financial inclusion (Demirgüç-Kunt, Hu and Klapper, 2019), but also in economic development, which means that it does not provide insights for only one category of countries in terms of development. As three waves were conducted over a 10-year window, it also allows exploring the effect of trust in banks on financial inclusion at different time periods.

We find evidence of a positive impact of trust in banks on financial inclusion. This result holds across a range of robustness tests, tackling endogeneity issues, using alternative variables and econometric models. We find that this result holds for all years and for the vast majority of countries examined. We show that the positive impact of trust in banks on financial inclusion affects everyone, regardless of their socio-demographic characteristics and of their

financial situation. As well, we find that some country characteristics, such as GDP per capita and the proportion of Muslims, moderate the positive effect of trust in banks on financial inclusion. In addition, we find that relative trust in banks, defined as the difference between trust in banks and trust in institutions, also has a positive impact on financial inclusion, highlighting the specific impact of trust in banks on financial inclusion. In a nutshell, our work provides strong support for the positive effect of trust in banks on financial inclusion worldwide.

Our research contributes to three strands of the literature. First, we deepen the literature on the influence of trust in banks on financial inclusion. While a few single-country works have studied this question (Ampudia and Palligkinis, 2018; Ghosh, 2021; Koomson, Koomson and Abdul-Mumuni, 2023), we provide a more comprehensive investigation using a large crosscountry dataset that examines the potential influence of individual factors on the relationship. This allows us to determine whether the effect of trust in banks on financial inclusion is conditional to the country or to the period. Moreover, we deepen this literature by exploring the individual factors that can affect the relationship between trust in banks and financial inclusion, such as socio-demographic characteristics, financial situation, confidence institutions, and country characteristics. Our work is the first to provide evidence of the positive effect of trust in banks on financial inclusion for the majority of the countries, and for the universality of the effect, regardless of the period, and of individual characteristics.

Second, we add to the literature on the effects of trust in banks. The empirical literature on the consequences of trust in banks remains scarce in comparison to the investigation of its determinants (van der Cruijsen, de Haan and Roerink, 2023). Our cross-country work provides an important contribution on the role of trust in banks in promoting financial inclusion.

Third, we contribute to the analysis on the effect of trust on banking services. Two studies have provided evidence of the effect of societal trust on bank lending (Nicolas, Tarazi and Danisman, 2023) and on bank risk-taking (Kanagaretnam et al., 2019). Our work complements this literature by focusing on the effect of trust in banks in particular on the ownership of a bank account.

This paper is organized as follows. Section 2.2 presents the data and methodology. Section 2.3 details our main results. Section 2.4 displays the moderating factors. Section 2.5 presents the robustness checks. We conclude in section 2.6.

#### 2.2. Data and methodology

#### 2.2.1. Measuring trust in banks and financial inclusion

To undertake our study, we utilize individual-level data coming from the Life in Transition Survey (LiTS) conducted in 2006, 2010, and 2016. The LiTS is a survey carried out since 2006 by European Bank for Reconstruction and Development in collaboration with the World Bank. The program mainly focuses on transition countries in Central and Eastern Europe and Central Asia. The surveys seek to evaluate how political, economic, and social transitions influence the lives of individuals in these countries. They address a diverse array of subjects such as living standards and personal viewpoints. The sample aims to be representative of the population of the regions surveyed. As far as we know, our dataset is the best to explore our research question, as it asks individuals about both their trust in banks and their financial inclusion. Our dataset is large and contains 61,312 observations from 28 countries. The countries surveyed are perfect for our work because they are diverse in terms of culture, size, and economic development. This dataset therefore allows for heterogeneity in financial inclusion. The three waves of the survey enable us to study the relationship between trust in banks and financial inclusion in three different periods.

We measure trust in banks, based on previous studies on trust in banks (e.g., Fungáčová, Kerola and Weill, 2022) with the following question of the surveys:

"To what extent do you trust the following institutions? Banks and the financial system? Complete distrust (1). Some distrust (2). Neither trust nor distrust (3). Some trust (4). Complete trust (5)." (LiTS 2006, 2010 and 2016)

Our key explanatory variable *Trust in banks* is coded with the answers to this question: it is an ordered variable with values between one and five. It corresponds therefore to a measure of trust in the banks and in all the institutions that facilitate the exchange of money throughout the economy. In line with previous studies on trust (OECD, 2017), we categorize "don't know/refused" responses as missing data.

We refer to financial inclusion as the ownership of a bank account, consistent with prior studies (e.g., Demirgüç-Kunt, Klapper and Singer, 2017). Financial inclusion is measured with the answers to the following questions in the three rounds of the LiTS:

"Does anyone in your household have a bank account? Yes (1). No (2)." (LiTS 2006) "Do you or anyone in your household own any of the following? A bank account. Cross all that apply." (LiTS 2010) "Do you have a bank or postal account? Yes, I have at least one account and I own at least one of them alone (1). Yes, I have at least one account, but I own all of them jointly with someone else (2). No (3)." This question was asked to the primary and secondary respondents. (LiTS 2016)

The survey responses have been recoded so that our dependent variable *Bank account* is a binary indicator: it takes on the value of one if someone in the respondent's household owns a bank account, and zero otherwise. Therefore, we consider in our work that an individual is financially included when he/she has a bank account. For the LiTS 2016 survey, the first two options have been recoded to one, while the last option is equal to zero, for both primary and secondary respondents.

In order to examine variation in financial inclusion within countries, we exclude from our sample country-year combinations where the mean of *Bank account* was less than 10 percent or more than 90 percent of the population. For instance, in countries such as Germany, financial inclusion may cover almost the entire population, making it irrelevant to compare trust in banks between financially included and non-financially included individuals. The list of the countries for the study can be found in Table 2.3.

#### 2.2.2. Methodology

To conduct our empirical analysis, we perform probit regressions and estimate the following model :

$$Pr (Bank \ account_i \ | \ Individual \ controls_i)$$
$$= \Phi(\alpha + \beta_1 \ Trust \ in \ banks_i + \beta_2 \ Individual \ controls_i$$
$$+ PSU - year \ fixed \ effects + \ \varepsilon_i)$$

where *i* indexes the individual and  $\Phi$  is the standard normal cumulative distribution function. We include fixed effects corresponding to the primary sampling unit (PSU) by year. These PSUs refer to the respondent's region of residence, representing geo-administrative divisions as specified in the LiTS and specific to each survey wave (EBRD, 2016). By introducing PSU-year fixed effects, we simultaneously control for precise regional characteristics and the year of the survey. Our dataset consists of 3,484 PSU-year observations. Observations located in PSU-year where the prediction in the outcome variable *Bank account* was perfect were automatically omitted in probit regressions due to collinearity issues. Since different households were surveyed for each wave of the LiTS, we do not need to include individual fixed effects to control for potential correlation of the error terms within the individuals. To facilitate the interpretation of the results, coefficients reported in the tables of estimations correspond to the marginal effects.

We use a range of individual-level controls in line with previous research on the determinants of financial inclusion (Fungáčová and Weill, 2015; Zins and Weill, 2016; Xu, 2020). *Female* controls for gender and is coded as one for women and zero otherwise. *Age/10* and  $Age^2/100$  account for the age of the respondent in years. We only included people over the age of 18, so our sample contains only adults. *Education* is an ordinal variable, ranging from zero to three and indicates the highest level of education attained by the respondent. A score of zero denotes no formal education, one corresponds to primary education, two indicates secondary education, and three represents completed tertiary or higher education.

*Income* captures the self-perceived income position of the respondent, scaled from one to ten, relative to others in the country. This income perception is derived from the following question:

"Please imagine a ten-step ladder where on the bottom, the first step, stand the poorest 10% people in our country, and on the highest step, the tenth, stand the richest 10% people in our country. On which step of the ten is your household today?" (LiTS 2006, 2010 and 2016)

*Married* indicates the marital status, with the value of one for married respondents and zero for others. The *Urban* variable indicates the type of residence, set to one for urban dwellers and zero for rural dwellers, as defined by the LiTS. We introduce *Job* to account for the employment status: it is a binary variable coded as one if the respondent was employed in the last year, and zero otherwise. *General trust* provides an insight into an individual's propensity to trust on a scale of one to five, measured by the respondent's level of trust in others, coming from the question:

"On a scale of 1 to 5, with 1 being complete distrust and 5 being absolute trust, how would you rate your general trust towards others?" (LiTS 2006, 2010 and 2016)

Table 2.1 provides an overview of the descriptive statistics for the variables employed in our analysis.

#### 2.3. Main estimations

This section examines the impact of trust in banks on financial inclusion. First, we report the baseline regressions performed on the full sample. Second, we perform regressions by country and by year. Third, we investigate the impact of relative trust in banks.

#### 2.3.1. Baseline regressions

We run probit regressions to examine the relationship between trust in banks and financial inclusion. We consider three different specifications to test the sensitivity of the results. Table 2.2 reports the results. In column (1), we include a basic set of controls (*Female, Age, Education, Income*) and PSU-year fixed effects to control for region and year. These four individual controls are the four socio-demographic characteristics included in the Global Findex database which have thus been used in works using this dataset (e.g., Zins and Weill, 2016; Xu, 2020). In columns (2) and (3), we include the full set of controls by adding *Married, Urban, Job,* and *General trust,* following works on the determinants of financial inclusion considering these variables (e.g., Ampudia and Palligkinis, 2018; Koomson, Koomson and Abdul-Mumuni, 2023). Year fixed effects are included in column (2) while PSU-year fixed effects are included in column (3). This allows us to check whether the results are affected by the set of controls and the use of PSU-year fixed effects.

We find that *Trust in banks* is significantly positive in all estimations. Therefore, an individual with a higher level of trust in banks is more likely to be financially included. This result supports the view that trust in banks exerts a positive impact on financial inclusion. It is consistent with the results of the three former studies (Ampudia and Palligkinis, 2018; Ghosh, 2021; Koomson, Koomson and Abdul-Mumuni, 2023), all of which find a positive impact of trust in banks on financial inclusion in their single-country frameworks.

Looking at the economic significance of the results, we find that a one-unit increase in trust in banks augments the probability of being financially included by 8.7 percentage points, in the most comprehensive specification (column (3)). Compared to the mean financial inclusion of the full sample (0.534), the effect of trust in banks on financial inclusion is economically significant.

Turning to the control variables, we note that the coefficients of *Education* and *Income* are significantly positive. This implies that higher education and higher income increase the probability of having a bank account, as observed in previous works on financial inclusion

(Fungáčová and Weill, 2015; Zins and Weill, 2016; Xu, 2020). We observe a nonlinear relationship between age and financial inclusion with a significantly positive coefficient for Age/10 and a significantly negative coefficient for  $Age^2/100$ . This means that the probability of being financially included increases with age up to a certain threshold, after which it decreases. Fungáčová and Weill (2015) and Zins and Weill (2016) obtain a similar finding. The result for gender is unusual: while *Female* is not significant in one specification, it is significantly positive in two others. These results do not accord with the general finding of lower financial inclusion for women observed in the literature. This may be due to the structure of the LiTS which surveys households rather than individuals, in contrast to Global Findex database generally used for works on financial inclusion.

We find that being employed has a positive impact on financial inclusion, as indicated by the significant and positive coefficient for *Job*. We find ambiguous results for the variables accounting for marital status (*Married*), urban residence (*Urban*) and general trust (*General trust*), as the significance of the coefficients varies with the inclusion of PSU-year fixed effects.

#### 2.3.2. Estimations by country and by year

We further explore the generalization of the positive impact of trust in banks on financial inclusion across countries by investigating whether this finding holds across all countries and for all years. We want to verify that the result is global and not conditional on one of the three survey years.

To this end, we run the regressions separately by country and by year. We consider the specification with all controls and PSU-year fixed effects in all regressions.

First, we run the regressions by country. Table 2.3 reports the coefficient of *Trust in banks* in all estimations. We find that the coefficient of *Trust in banks* is positive in almost all countries in the sample (25 out of 28), with a significant coefficient in the majority of countries (17 out of 28). Moreover, the effect of trust in banks on financial inclusion is not significantly negative in any of the countries.

These results show that the positive effect of trust in banks on financial inclusion is not driven by a few countries but rather tends to be universal. It remains consistent across countries that are very heterogeneous in terms of geography, culture or development. However, we can see that it is not necessarily statistically significant in all countries.

Second, we run the regressions by year. Here we question the timelessness of the main result. The three rounds of the LiTS took place in 2006, 2010, and 2016. This allows us to examine whether the main result is conditional on the year of the survey, and in particular

whether the onset of the Global Financial Crisis in 2008-2009 and its aftermath have affected the results. These estimations also have the advantage of overcoming the potential bias due to slight differences between the survey questions.

Table 2.4 reports the coefficient of *Trust in banks* in all estimations. We find a significantly positive coefficient for *Trust in banks* in all survey years. Thus, the positive impact of trust in banks on financial inclusion persists over time.

#### 2.3.3. Relative trust in banks

So far, we have found evidence that trust in banks has a positive impact on financial inclusion. However, we can ask whether trust in banks plays a specific role or whether it is not trust in all institutions that contributes to enhance financial inclusion. It may indeed be the case that higher trust in all institutions increases the willingness of individuals to open a bank account. In this case, trust in banks could serve as a proxy for trust in all institutions. Our result would then be misinterpreted, as trust in banks would have a specific impact on financial inclusion.

To test the interpretation of our main finding, we examine the impact of the relative trust in banks defined as the level of trust in banks relative to trust in other institutions on financial inclusion. To do so, we follow the approach of Fungáčová, Hasan and Weill (2019) and create the variable *Relative trust in banks*, equal to the difference between *Trust in banks* and *Trust in courts*. They use *Trust in courts* as a proxy for trust in institutions because the judicial system is a core institution and since this component of trust is not as affected by political preferences as other components of trust in institutions like trust in the government. *Trust in courts* is an ordered variable that takes values on a five-point scale and is defined by responses to the same question as *Trust in banks*:

"To what extent do you trust the following institutions? Courts? Complete distrust (1). Some distrust (2). Neither trust nor distrust (3). Some trust (4). Complete trust (5)." (LiTS 2006, 2010 and 2016)

If we observe a significant and positive effect of *Relative trust in banks*, it would suggest that the difference between trust in banks and trust in courts explains financial inclusion. In other words, trust in banks specifically promotes financial inclusion compared to trust in institutions in general.

If we find no significant effect for *Relative trust in banks*, this result combined with the finding of a significantly positive coefficient for *Trust in banks* would imply that trust in banks does not specifically affect financial inclusion compared to trust in institutions.

Table 2.5 reports the estimations for the three specifications presented in the main estimations. We find a significantly positive coefficient for *Relative trust in banks* in all specifications. This means that trust in banks specifically has a positive impact on financial inclusion. Thus, this result confirms our conclusion about the importance of trust in banks in promoting financial inclusion.

#### 2.4. Moderating variables

In this section, we complement our main results by examining whether they are affected by individual or country factors. We consider the potential impact of socio-demographic factors, of the financial situation, of confidence in institutions, and of country characteristics.

In all estimations, we use the specification with all individual controls and add PSUyear fixed effects when studying individual factors. We examine the influence of the moderating variables through the addition of interaction terms between the tested variable and trust in banks. We run OLS regressions so that the sign and the significance of the interaction terms can be considered directly.

#### 2.4.1. Socio-demographic characteristics

We test whether the relationship between trust in banks and financial inclusion is affected by socio-demographic characteristics.

We want to know whether the positive impact of trust in banks on financial inclusion is universal and does not vary across socio-demographic characteristics. Previous evidence on this question is limited. We are only aware of the results of Ghosh (2021) in his single-country work in India. He finds no effect of gender and of urban residence on the relationship between trust in banks and financial inclusion in India.

We consider four socio-demographic characteristics: gender, age, education, and urban residence. We test the hypothesis that the impact of trust in banks on motivating individuals to be financially included varies with their socio-demographic characteristics. For example, women, who have been shown to be more risk-averse than men (Croson and Gneezy, 2009), may require greater trust in banks to overcome their reluctance to open a bank account. Similarly, trust in banks may be less important for older people with more established beliefs than for younger people.

Table 2.6 reports the results. We observe that the coefficients of the interaction terms

for the four variables tested are all insignificant. Thus, we reject the hypothesis that the positive impact of trust in banks on financial inclusion varies with gender, age, education, and urban residence.

This finding supports the view that the positive impact of trust in banks on financial inclusion affects everyone, regardless of their socio-demographic characteristics.

#### 2.4.2. Financial situation

We also examine whether the impact of trust in banks on financial inclusion varies with individual financial characteristics.

We test the hypothesis that the effect of trust in banks on financial inclusion depends on the financial situation of the individual. This hypothesis is motivated by the fact that individuals with a better financial situation may be less influenced by trust in banks to be financially included. A key finding of the financial inclusion literature is that the first selfreported barrier for not having a bank account is the lack of money to use one (e.g. Demirgüç-Kunt and Klapper, 2012). Symmetrically, individuals with a better financial situation may not be sensitive to the level of trust in banks when deciding to open a bank account.

We test this hypothesis by considering three variables related to the financial situation of the individual: *Income*, *Job*, and *Financial satisfaction*. While *Income* and *Job* are presented above and included as controls in the baseline estimations, we introduce a new variable in the estimations with *Financial satisfaction*. We did not include this variable in the baseline estimations because it is only available for LiTS 2010 and 2016. This variable corresponds to the self-assessed level of financial satisfaction on a five-point scale, obtained from the LiTS survey:

"To what extent do you agree with the following statements? All things considered, I am satisfied with my financial situation as a whole. Strongly disagree (1). Disagree (2). Neither disagree nor agree (3). Agree (4). Strongly agree (5)." (LiTS 2010 and 2016)

Table 2.7 shows the results. We find that the interaction terms for the three variables are not significant. Therefore, the hypothesis that financial situation affects the relationship between trust in banks and financial inclusion is rejected.

#### 2.4.3. Confidence in institutions

Then, we consider whether the relationship between trust in banks and financial inclusion is influenced by confidence in institutions.

Two opposing hypotheses can be proposed. On the one hand, trust in institutions may complement trust in banks. Higher trust in institutions may enhance the positive impact of trust in banks on financial inclusion if individuals believe that banks are more trustworthy in the presence of stronger institutions that maintain sound governance and financial stability.

On the other hand, trust in institutions can serve as a substitute for trust in banks. When individuals have high trust in institutions, they may be less concerned about their level of trust in banks when deciding to be financially included. This may explain why Fungáčová, Hasan and Weill (2019) observe lower levels of trust in banks in developed countries with the highest levels of financial inclusion in the world. Consequently, we should observe that trust in banks has a lower impact on financial inclusion when trust in institutions is higher.

We consider three variables to measure the different dimensions of confidence in institutions.

First, we consider the perception of corruption with the variable *Perception of corruption*, which is derived from the following LiTS question (available in LiTS 2016 only):

"In your opinion, what are the three most important problems facing this country that government should address? Cross the three problems that apply. And which is the most important? Mark with a cross the most important. Health. Crime. The economy. Education. Environment. Corruption/Bribery. Transportation, roads, infrastructure. Immigration. Political stability and security. Unemployment." (LiTS 2016)

*Perception of corruption* is an ordered variable that takes a value of two if respondents consider corruption or bribery to be the most important problem facing the country, a value of one if respondents consider corruption or bribery to be one of the three most important problems facing the country, and a value of zero otherwise.

Second, we consider the confidence in courts with the variable *Trust in courts* described above. It provides information on the confidence of individuals in the judicial system.

Third, we consider the confidence in the government with the variable *Trust in government*, which corresponds to the individual level of trust in the government, on a five-point scale. The data come from the following question of the LiTS:

"To what extent do you trust the following institutions? The government/cabinet of ministers? Complete distrust (1). Some distrust (2). Neither trust nor distrust (3). Some trust (4). Complete trust (5)." (LiTS 2006, 2010 and 2016)

Table 2.8 reports the results. First, we find no evidence that perception of corruption affects the relationship between trust in banks and financial inclusion. The interaction term *Perception of corruption*  $\times$  *Trust in banks* is insignificant. Second, we find a positive impact of the second second

trust in courts and in government on the relationship between trust in banks and financial inclusion. We observe that the interaction term of *Trust in banks* with *Trust in courts* and *Trust in government* is significantly negative.

Thus, we can support the substitution view regarding the influence of trust in institutions on the relationship between trust in banks and financial inclusion. While no effect is observed for the perception of corruption, the confidence of individuals in courts and in government reduces the positive impact of trust in banks on financial inclusion. In terms of policy implications, this finding implies that fostering trust in banks to promote financial inclusion is particularly important in countries with low confidence in institutions.

#### 2.4.4. Country characteristics

Finally, we examine whether the relationship between trust in banks and financial inclusion is moderated by country characteristics.

When conducting regressions by country in Table 2.3, we have found a positive effect of trust in banks on financial inclusion for 25 over the 28 countries of the sample, but it was significant only for 17 countries. These cross-country differences in significance suggest that the relationship between trust in banks and financial inclusion can be conditional to country characteristics. Thus, we aim at explaining these differences by analyzing interaction effects of trust in banks with country characteristics.

We test three explanations. First, the positive effect of trust in banks on financial inclusion might be greater in more developed countries. Strong regulatory frameworks in developed countries ensure the safety and security of financial transactions, encouraging more people to engage with banks. In other words, trust in banks when combined with greater economic development has a greater influence on financial inclusion. Second, we expect the positive effect of trust in banks on financial inclusion to be higher for countries with a well-developed financial sector. In countries with stronger financial institutions, individuals have easier access and use for banking services when they trust these institutions. Third, the effect of trust in banks on financial inclusion could be lower in countries with a higher proportion of Muslims. This hypothesis relies on evidence that Muslims are more reluctant to use conventional banking services for religious principles (Demirgüc-Kunt, Klapper and Randall, 2014).

We test these hypotheses by including respectively *GDP per capita*, *Private credit to GDP* and *Muslim*. *GDP per capita* is equal to the natural logarithm of the real GDP in the country at the survey year, with data coming from the World Development Indicators. *Private* 

*credit to GDP* corresponds to private credit by deposit money banks as a share of the GDP of the country during the year of the survey, from the Global Financial Development Database. *Muslim* refers to the proportion of Muslims in the country, in percentage. Data are available for 2010 and come from the Pew Research Center. As we study country-level characteristics, we exclude PSU-year fixed effects from these regressions. PSU-year fixed effects incorporate the characteristics of the country, which absorb the effect of country characteristics on financial inclusion. We therefore prefer to add country fixed effects and year fixed effects for these estimations.

Table 2.9 outlines the results. We observe a positive and significant coefficient for *GDP* per capita  $\times$  Trust in banks. This confirms the hypothesis that the effect of trust in banks on financial inclusion is stronger when economic development is higher. The interaction term *Private credit to GDP*  $\times$  Trust in banks is not significant, rejecting the hypothesis that the effect of trust in banks on financial inclusion is strengthened by financial development. Finally, *Muslim*  $\times$  Trust in banks is significantly negative, which validates the hypothesis that the influence of trust in banks on financial inclusion is lower in countries with a higher proportion of Muslims among the population.

#### 2.5. Robustness checks

In this section, we test the robustness of our results. First, we conduct an instrumental variable analysis. We then check the sensitivity of our results using alternative regression methods. Finally, we examine whether the results remain consistent with alternative variables for trust in banks and financial inclusion.

#### 2.5.1 Instrumental variable approach

Our findings may be affected by an endogeneity issue. Our results may be subject to a reverse causality issue as financial inclusion may also affect trust in banks. In addition, omitted variables may simultaneously affect both trust in banks and financial inclusion. To mitigate these potential endogeneity concerns, we have so far included several control variables and PSU-year fixed effects in our regressions.

We go one step further to address endogeneity issues by performing IV probit regressions between trust in banks and financial inclusion by the Maximum Likelihood Estimation (MLE) method. We employ *Mean PSU trust in banks*, a variable equal to the mean

trust in banks in the PSU of the individuals, excluding the individual's own level of trust in banks from the calculation of the mean. We expect trust in banks in the region to be highly related to the respondent's trust in banks. In fact, individuals living in the same region share the same financial institutions, meaning companies specialized in handling financial transactions (such as banks, pension funds and insurance companies), and therefore may experience or have experienced the same financial events such as a financial crisis (Fungáčová, Kerola and Weill, 2022), or inflation (Heyert and Weill, 2024), which deeply hinder their trust in banks.

Moreover, the cultural homogeneity of the region may lead to a uniform level of trust in banks. In particular, individuals in the region may share similar financial knowledge (van der Cruijsen, de Haan and Roerink, 2021) and general trust (Xu, 2020), which may increase their trust in banks. They also live in the same banking environment, including the presence of a deposit insurance or similar bank concentration, which may lead to similar levels of trust in banks across the region. Hence, the level of regional trust in banks is related to the individual's trust in banks. Thus, *Mean trust in banks* appears as a relevant instrument for our study. Moreover, there is no theoretical evidence that the mean trust in banks in the region has a direct impact on the individual's financial inclusion. Regional trust in banks excluding the individual's trust in banks does not directly explain the individual's financial inclusion. This supports the view that *Mean PSU trust in banks* can be considered as valid instrument for our work. PSU-year fixed effects containing only one observation, are therefore excluded from the estimations.

Table 2.10 presents the results of the outcome and structural equations of IV probit regressions. Since we use the mean trust in banks of the respondent's PSU-year as an instrument, we therefore omit PSU-year fixed effects in our instrumental variable models. PSU-year fixed effects already take into account the characteristics of the respondent's PSU at the time of the interview, which could cancel out the effect of our instrument *Mean PSU trust in banks*. Hence, we introduce country fixed effects coupled with year fixed effects instead of PSU-year fixed effects for these estimations.

We consider three models, all of which include year fixed effects. In column (1), we include the basic set of controls. In columns (2) and (3), we include the full set of controls. In columns (1) and (3), we also control for time-invariant country characteristics with country fixed effects. A Wald test of exogeneity has been used to assess the endogeneity of our models. The test is significant for our three specifications suggesting that our models may confounded by endogeneity concerns. The structural equation results show a significant and positive

association between the *Mean PSU trust in banks* and *Trust in banks*. This indicates that individuals from regions with greater trust in banks tend also to trust banks more. This supports the choice of our instrument *Mean PSU trust in banks*.

The outcome equation results are consistent with our primary findings. In all models, we again observe significant and positive coefficients for *Trust in banks*. In sum, these results confirm our conclusion that trust in banks increases financial inclusion. The results are robust even after addressing potential endogeneity concerns.

#### 2.5.2. Alternative regression methods

We run alternative regressions methods to check the robustness of our findings in Table 2.11. Given that our dependent variable *Bank account* is a dummy variable, we first perform a logistic regression. We examine the same three models as before. Again, we find positive and significant effects of *Trust in banks* in all models.

Next, we use an OLS regression to examine the impact of trust in banks on financial inclusion. Again, we observe a positive and significant coefficient for *Trust in banks* in each model. Consequently, the results of logistic and OLS regressions reinforce our conclusion that trust in banks fosters financial inclusion.

#### 2.5.3 Alternative variables

We test the influence of alternative variables for trust in banks and financial inclusion in Table 2.11.

First, we redo the estimations by measuring trust in banks with the variable *Trust in banks dummy*, which equals one if the individual reports having complete or some trust in banks, and zero otherwise. We find a significant and positive effect of *Trust in banks dummy* on *Bank account* in all models, in line with our main findings.

Second, we conduct our estimations with two alternative measures of financial inclusion. Firstly, we consider *Card* as a dummy variable that takes a value of one if the individual or someone in the household owns a credit or debit card, and zero otherwise. This variable is available in LiTS 2006 and LiTS 2010. Following Stix (2013), we consider credit or debit card ownership as a proxy for bank access. Card ownership implies that the individual also owns a bank account. Using this variable also allows us to examine the impact of trust in banks on financial inclusion. Moreover, we employ *Card* because measuring financial inclusion with the dummy *Bank account* might not efficiently reflect the use of banking services. Indeed, an individual could have opened a bank account without using it. Thereby,

*Card* could better represent financial inclusion through the use of banking services. We again observe significant and positive coefficients for *Trust in banks* in our three specifications, meaning that trust in banks promotes the use of a bank account.

Finally, we rerun our estimations using *Bank account respondent* as a different measure of *Bank account. Bank account respondent* is a dummy variable equal to one when the respondent owns a bank account, and zero otherwise. As *Bank account* reflects the financial inclusion of the household of the individual, considering the financial inclusion of the respondent her/himself rather than her/his household allows greater precision for our findings. This also allows to account for slight differences in LiTS questions across waves. Data are only available in LiTS 2016 for this variable. We find a significant and positive effect of trust in banks on the financial inclusion of the respondent. This result confirms our main findings.

#### 2.6. Conclusion

This paper examines the impact of trust in banks on financial inclusion in a crosscountry framework. We use micro-level data informing on trust in banks and financial inclusion for a sample of about 61,000 observations from 28 countries to examine this question.

The key finding is the positive impact of trust in banks on financial inclusion. We find strong support for the beneficial effect of trust in banks to promote financial inclusion. First, this result is robust to tests controlling for endogeneity, alternative estimation methods, and alternative definitions of trust in banks and financial inclusion. Second, we observe this result for all years and for the vast majority of countries examined. No country is found to have a negative influence of trust in banks on financial inclusion. Third, we document that the positive impact of trust in banks on financial inclusion affects everyone, regardless of their sociodemographic characteristics and of their financial situation. Fourth, we find that relative trust in banks, defined as the difference between trust in banks and trust in institutions, also has a positive impact on financial inclusion. This result implies that it is specifically trust in banks, and not trust in all institutions, that drives financial inclusion. Fifth, the positive effect of trust in banks on financial inclusion is strengthened by economic development, while it is reduced in countries with a higher proportion of Muslims.

Thus, the take-away message of this work in terms of policy implications is straightforward. Improving trust in banks is a very relevant policy to promote financial inclusion, which is not conditional on the country or the socio-demographic characteristics of the individual. The impact of trust in banks on financial inclusion, regardless of individual characteristics, suggests a need for broad-based, inclusive financial policies that address barriers to trust in banks. Countries within Central and Eastern Europe and Central Asia may benefit from sharing strategies to build trust in banks. Such cooperation could lead to regional improvements in financial inclusion. Enhancing financial inclusion through trust in banks in Central and Eastern Europe and Central Asia in particular, could drive economic growth by enabling more individuals and businesses to access essential financial services, thereby fostering investment, consumption, and entrepreneurship. Additionally, it can increase social stability and reduce economic disparities by providing all demographic groups with opportunities for financial empowerment and participation in the economy. Given the role of financial inclusion in economic development, research should be done on what which policies can foster trust in banks. We leave these questions for further research.

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### Tables

# Table 2.1.Descriptive statistics

This table provides the descriptive statistics for the variables employed in this study.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Bank account	61,312	0.534	0.499	0	1
Trust in banks	61,312	2.966	1.254	1	5
Trust in banks dummy	61,312	0.389	0.487	0	1
Relative trust in banks	58,982	0.322	1.323	-4	4
Mean PSU trust in banks	61,312	2.966	0.714	1	5
Bank account respondent	21,852	0.566	0.496	0	1
Card	39,446	0.400	0.490	0	1
Female	61,312	0.567	0.495	0	1
Age/10	61,312	4.591	1.697	1.8	9.9
Age <sup>2</sup> /100	61,312	23.952	16.641	3.24	98.01
Education	61,312	2.069	0.741	0	3
Income	61,312	4.443	1.727	1	10
Married	61,191	0.623	0.485	0	1
Urban	61,312	0.591	0.492	0	1
Job	56,492	0.544	0.498	0	1
General trust	58,908	2.785	1.131	1	5
Financial satisfaction	41,341	2.778	1.162	1	5
Trust in courts	58,982	2.633	1.294	1	5
Trust in government	59,899	2.628	1.322	1	5
Perception of corruption	21,699	0.482	0.708	0	2
GDP per capita	61,312	9.657	0.514	8.036	10.661
Private credit to GDP	60,448	42.784	16.823	11.561	94.676
Muslim	61,312	27.287	35.949	0.05	99

### Table 2.2.Main estimations

This table presents the results of probit regressions. The dependent variable is *Bank account*. The reported coefficients are marginal effects. Standard errors are given in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Trust in banks	0.083***	0.045***	0.087***
	(0.006)	(0.005)	(0.007)
Female	-0.008	0.037***	0.030*
	(0.014)	(0.011)	(0.016)
Age/10	0.232***	0.123***	0.115***
	(0.023)	(0.020)	(0.027)
Age <sup>2</sup> /100	-0.031***	-0.012***	-0.018***
	(0.002)	(0.002)	(0.003)
Education	0.327***	0.113***	0.311***
	(0.012)	(0.008)	(0.013)
Income	0.160***	0.108***	0.158***
	(0.005)	(0.003)	(0.005)
Married		-0.137***	0.011
		(0.012)	(0.017)
Urban		0.182***	0.232
		(0.012)	(0.164)
Job		0.239***	0.282***
		(0.013)	(0.018)
General trust		0.005	0.016**
		(0.005)	(0.008)
Year FE	No	Yes	No
PSU-year FE	Yes	No	Yes
Observations	49,969	54,166	43,321
Pseudo R-squared	0.327	0.078	0.334

### Table 2.3.Estimations by country

This table presents the results of probit regressions by country. The dependent variable is *Bank account*. The reported coefficients are marginal effects of *Trust in banks*. Standard errors are given in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Trust in bar	nks	Standard error	Individual controls	PSU-year fixed effects	Observations
Albania	0.112 *	***	(0.035)	Yes	Yes	2,400
Armenia	0.090 *	***	(0.030)	Yes	Yes	1,401
Belarus	-0.008		(0.037)	Yes	Yes	1,758
Bosnia and Herzegovina	0.047		(0.033)	Yes	Yes	1,732
Bulgaria	0.171 *	***	(0.035)	Yes	Yes	2,055
Croatia	-0.054		(0.044)	Yes	Yes	1,545
Czech Republic	0.329 *	***	(0.069)	Yes	Yes	847
Georgia	0.133 *	**	(0.054)	Yes	Yes	851
Hungary	0.123 *	***	(0.031)	Yes	Yes	2,620
Italy	0.162 *	4	(0.084)	Yes	Yes	629
Kazakhstan	0.047		(0.038)	Yes	Yes	1,724
Kosovo	0.015		(0.042)	Yes	Yes	1,263
Kyrgyz Republic	0.074		(0.061)	Yes	Yes	491
Latvia	0.251 *	***	(0.042)	Yes	Yes	1,600
Lithuania	0.17 *	***	(0.038)	Yes	Yes	1,736
Macedonia	0.085 *	***	(0.032)	Yes	Yes	1,741
Moldova	0.078		(0.053)	Yes	Yes	962
Mongolia	0.074 *	**	(0.033)	Yes	Yes	1,635
Montenegro	-0.022		(0.039)	Yes	Yes	1,397
Poland	0.092 *	***	(0.035)	Yes	Yes	2,770
Romania	0.132 *	***	(0.032)	Yes	Yes	2,152
Russia	0.099 *	***	(0.027)	Yes	Yes	2,335
Serbia	0.116 *	***	(0.029)	Yes	Yes	2,126
Slovak Republic	0.124 *	*	(0.056)	Yes	Yes	836
Tajikistan	0.064		(0.089)	Yes	Yes	397
Turkey	0.003		(0.026)	Yes	Yes	2,155
Ukraine	0.074 *	•	(0.043)	Yes	Yes	1,498
Uzbekistan	0.006		(0.057)	Yes	Yes	665
### Table 2.4.Estimations by year

This table presents the results of probit regressions. The dependent variable is *Bank account*. The reported coefficients are marginal effects. Standard errors are given in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	2006	2010	2016
Trust in banks	0.111***	0.049***	0.102***
	(0.011)	(0.012)	(0.014)
Individual controls	Yes	Yes	Yes
Year FE	No	No	No
PSU-year FE	Yes	Yes	Yes
Observations	16,053	15,959	11,309
Pseudo R-squared	0.363	0.314	0.313

### Table 2.5.Relative trust in banks

This table presents the results of probit regressions. The dependent variable is *Bank account*. The reported coefficients are marginal effects. Standard errors are given in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Relative trust in banks	0.058***	0.046***	0.057***
	(0.006)	(0.004)	(0.006)
Female	-0.001	0.042***	0.037**
	(0.015)	(0.012)	(0.016)
Age/10	0.223***	0.120***	0.106***
	(0.024)	(0.021)	(0.028)
Age <sup>2</sup> /100	-0.030***	-0.012***	-0.017***
	(0.002)	(0.002)	(0.003)
Education	0.332***	0.114***	0.313***
	(0.012)	(0.009)	(0.013)
Income	0.168***	0.112***	0.166***
	(0.005)	(0.003)	(0.005)
Married		-0.133***	0.016
		(0.013)	(0.017)
Urban		0.180***	0.214
		(0.012)	(0.169)
Job		0.236***	0.279***
		(0.013)	(0.019)
General trust		0.016***	0.031***
		(0.005)	(0.008)
Year FE	No	Yes	No
PSU-year FE	Yes	No	Yes
Observations	47,842	52,178	41,496
Pseudo R-squared	0.327	0.079	0.333

### Table 2.6. Interactions with socio-demographic characteristics

	(1)	(2)	(3)	(4)
Female × Trust in banks	-2.694e-05			
	(2.614e-03)			
Age/10 × Trust in banks		9.914e-04		
		(4.426e-03)		
$Age^{2}/100 \times Trust in banks$		7.164e-05		
		(4.493e-04)		
Education × Trust in banks			-1.388e-03	
			(1.784e-03)	
Urban × Trust in banks				0.004
				(0.003)
Female	0.006	0.006*	0.006*	0.006*
	(0.008)	(0.003)	(0.003)	(0.003)
Age/10	0.025***	0.021	0.025***	0.025***
	(0.006)	(0.015)	(0.006)	(0.006)
Age <sup>2</sup> /100	-0.004***	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Education	0.067***	0.067***	0.072***	0.067***
	(0.003)	(0.003)	(0.006)	(0.003)
Urban	0.064	0.064	0.064	0.051
	(0.041)	(0.041)	(0.041)	(0.042)
Trust in banks	0.019***	0.013	0.022***	0.016***
	(0.002)	(0.010)	(0.004)	(0.002)
Individual controls	Yes	Yes	Yes	Yes
Year FE	No	No	No	No
PSU-year FE	Yes	Yes	Yes	Yes
Observations	54,166	54,166	54,166	54,166
Adjusted R-squared	0.467	0.468	0.467	0.467

### Table 2.7.Interactions with financial situation

	(1)	(2)	(3)
Income × Trust in banks	6.878e-04		
	(7.723e-04)		
Job × Trust in banks		-2.382e-04	
		(2.654e-03)	
Financial satisfaction × Trust in banks			-0.002
			(0.001)
Income	0.033***	0.035***	0.027***
	(0.003)	(0.001)	(0.002)
Job	0.060***	0.060***	0.049***
	(0.004)	(0.009)	(0.005)
Financial satisfaction			0.024***
			(0.005)
Trust in banks	0.016***	0.019***	0.018***
	(0.004)	(0.002)	(0.004)
Individual controls	Yes	Yes	Yes
Year FE	No	No	No
PSU-year FE	Yes	Yes	Yes
Observations	54,166	54,166	34,937
Adjusted R-squared	0.467	0.467	0.461

### Table 2.8.Interactions with confidence in institutions

	(1)	(2)	(3)
Perception of corruption × Trust in banks	4.548e-04		
	(3.184e-03)		
Trust in courts × Trust in banks		-0.006***	
		(0.001)	
Trust in government × Trust in banks			-0.006***
			(0.001)
Perception of corruption	0.003		
	(0.010)		
Trust in courts		0.014***	
		(0.004)	
Trust in government			0.018***
			(0.004)
Trust in banks	0.019***	0.034***	0.035***
	(0.003)	(0.003)	(0.003)
Individual controls	Yes	Yes	Yes
Year FE	No	No	No
PSU-year FE	Yes	Yes	Yes
Observations	16,372	52,178	52,957
Adjusted R-squared	0.468	0.470	0.469

# Table 2.9.Interactions with country characteristics

	(1)	(2)	(3)
GDP per capita × Trust in banks	0.006**		
	(0.003)		
Private credit to GDP × Trust in banks		5.694e-05	
		(9.256e-05)	
Muslim × Trust in banks			-1.007e-04**
			(4.373e-05)
GDP per capita	-0.404***		
	(0.037)		
Private credit to GDP		-1.312e-04	
		(3.712e-04)	
Muslim			-4.490e-03***
			(2.072e-04)
Trust in banks	-0.037	0.023***	0.027***
	(0.031)	(0.004)	(0.002)
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
PSU-year FE	No	No	No
Observations	54,166	53,326	54,166
Adjusted R-squared	0.299	0.294	0.298

### Table 2.10.Instrumental variable estimates

This table presents the results of instrumental variable probit models by the MLE method. The upper part of the table displays the results of the outcome regression equation. *Trust in banks* is instrumented by *Mean PSU trust in banks*. The dependent variable is *Bank account*. The reported coefficients are marginal effects. Standard errors are given in parentheses. The lower part of the table shows the results of the structural regression equation with the dependent variable *Trust in banks*, as well as the endogeneity test. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Trust in banks	0.127***	0.018*	0.150***
	(0.012)	(0.010)	(0.013)
Female	0.011	0.038***	0.041***
	(0.011)	(0.011)	(0.013)
Age/10	0.165***	0.119***	0.106***
	(0.019)	(0.021)	(0.022)
Age <sup>2</sup> /100	-0.022***	-0.011***	-0.015***
	(0.002)	(0.002)	(0.002)
Education	0.285***	0.114***	0.240***
	(0.009)	(0.008)	(0.010)
Income	0.097***	0.110***	0.097***
	(0.004)	(0.004)	(0.004)
Married		-0.136***	-0.042***
		(0.012)	(0.014)
Urban		0.179***	0.192***
		(0.012)	(0.013)
Job		0.239***	0.218***
		(0.013)	(0.014)
General trust		0.010*	-0.014**
		(0.005)	(0.006)
Year FE	Yes	Yes	Yes
Country FE	Yes	No	Yes
Observations	61,312	54,166	54,166
Structural equation			
Mean PSU trust in banks	0.790***	0.809***	0.757***
	(0.007)	(0.007)	(0.008)
Wald test of exogeneity	22.32***	9.68***	27.84***

### Table 2.11.Robustness checks

This table presents the results of the robustness checks. Probit regressions are performed unless other indicated. The dependent variable is *Bank account* unless other indicated. The set of control variables includes *Female, Age/100, Education* in column (1). It additionally includes *Married, Urban, Job, General trust* in columns (2) and (3). The reported coefficients are marginal effects. Standard errors are given in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)		
Alt	ernative estimation method :	logit model			
Trust in banks	0.144***	0.074***	0.151***		
	(0.011)	(0.008)	(0.012)		
Alte	ernative estimation method :	OLS model			
Trust in banks	0.019***	0.017***	0.019***		
	(0.001)	(0.002)	(0.002)		
Alternative variable for trust in banks : Trust in banks dummy					
Trust in banks dummy	0.187***	0.095***	0.190***		
	(0.016)	(0.012)	(0.017)		
	Alternative dependent variab	ole : Card			
Trust in banks	0.067***	0.013**	0.064***		
	(0.008)	(0.006)	(0.008)		
Alternative	e dependent variable : Bank	account respondent			
Trust in banks	0.077***	0.039***	0.103***		
	(0.011)	(0.008)	(0.014)		
Year FE	No	Yes	No		
PSU-year FE	Yes	No	Yes		

### Chapter 3<sup>14</sup>

### **Is Financial Inclusion a Source of Happiness?**

#### Abstract

This paper investigates whether financial inclusion affects life satisfaction. We perform regressions at the individual level on a large dataset of 59,209 individuals from 29 countries. We find evidence that financial inclusion improves life satisfaction. We further establish that the beneficial effect of financial inclusion takes place through a better health, education and to a lesser extent through the launch of a business. We observe that the positive impact of financial inclusion on life satisfaction is greater in countries with higher income per capita, and lower in countries recently struck by a financial crisis. Our results indicate that promoting financial inclusion can enhance happiness.

**JEL Codes**: G21 • I31 • O16 • P46

Keywords: financial inclusion • life satisfaction • banking

<sup>&</sup>lt;sup>14</sup> This chapter is co-written with Laurent Weill and has been published in the *International Review of Financial Analysis* (2024).

#### **3.1. Introduction**

Financial inclusion, i.e. the use of formal financial services, has been progressively part of the global development agenda (Sahay et al., 2015; Demirgüç-Kunt, Klapper and Singer, 2017). Country-level studies have shown that financial inclusion fosters economic growth (Kim, Yu and Hassan, 2018), lowers poverty (Neaime and Gaysset, 2018), impairs tax evasion (Beck, Lin and Ma, 2014), reduces energy inequality (Dong et al., 2024), and enhances financial stability (Cull, Demirgüç-Kunt and Lyman, 2012; Ahamed and Mallick, 2019) and bank performance (Ahamed et al., 2021). There is therefore a consensual view that financial inclusion can tackle underdevelopment issues.

However, evidence on the effects of financial inclusion at the individual level remains scarce. In particular, we can question whether financial inclusion affects happiness of people. At first glance, it may seem obvious that the benefits of financial inclusion in terms of economic growth should increase life satisfaction. Nevertheless, literature has shown that living in a growing country is not necessarily associated with life satisfaction (e.g., Guriev and Melnikov, 2018). The question whether happiness follows the evolution of income per capita remains hotly debated (e.g., Easterlin, 1995; Stevenson and Wolfers, 2008).

Furthermore, from an identification perspective, a positive relation between financial inclusion and economic growth at the country level does not imply a positive relation between being financial included and life satisfaction at the individual level.

Our aim in this study is to examine whether financial inclusion influences life satisfaction. In its most basic definition, financial inclusion refers to the fact that a person owns an account at a formal financial institution. We test the hypothesis that having a bank account increases life satisfaction. A bank account is expected to bring benefits for an individual. First, it makes everyday life easier since a bank account facilitates financial transactions. Second, it brings confidentiality and safety by lowering the incidence of crimes associated with the use of cash. Third and foremost, an account in a formal financial institution gives an easier access to credit allowing individuals to invest in essential commodities such as education, dwelling, or business.

As explained by Diener, Kahneman and Helliwell (2010), three main theoretical approaches can explain life satisfaction. The first one is needs-based and assumes greater life satisfaction when various needs are met. The second one is activity-based and considers that life satisfaction is higher when a person is engaged in activities that are experienced as

meaningful. The third one is about genetic and personality-predisposition theories, according to which a certain level of life satisfaction would be rooted in each person's personality. From this perspective, financial inclusion can enhance life satisfaction through two ways. First, it contributes to satisfy needs through safety and confidentiality, and through easier access to education, dwelling, or business. Second, it helps persons to be engaged in meaningful experiences by increasing their possibilities to launch business.

To undertake our work, we utilize data from the three waves (2006, 2010, and 2016) of the Life in Transition Survey conducted by the European Bank for Reconstruction and Development. This survey provides individual-level information on financial inclusion and on life satisfaction, in addition to other socio-demographic determinants for the three waves considered. The sample gathers 59,209 observations from 29 countries, mostly located in Central and Eastern Europe and Central Asia. This cross-country dataset enables us to have heterogeneity in financial inclusion, but also in terms of economic and institutional development. To the best of our knowledge, the Life in Transition Survey is the best source of data for our research question since it is the only cross-country dataset providing individual data jointly on financial inclusion and on life satisfaction.

Our primary finding is that financial inclusion favors life satisfaction. We confirm this result in a battery of robustness checks, tackling potential endogeneity concerns, including controlling for regional fixed effects, and using alternative econometric models. We further investigate the channels through which financial inclusion affects life satisfaction. We establish that the beneficial effect of financial inclusion takes place through education, health, and the launch of a business. Being financially included increases the probability to have a better education, a better health, and to launch a business, resulting in greater life satisfaction. We also observe that the positive impact of financial inclusion on life satisfaction differs with the country characteristics. It is higher in countries with higher income per capita, and lower in countries recently struck by a financial crisis.

Our investigation contributes to two strands of the literature. First, we augment the literature on the effects of financial inclusion. As surveyed by Ozili (2021), research on financial inclusion has investigated different effects of financial inclusion. We add to this body of analysis by focusing on the key outcome of human life: happiness. The closest paper to ours is the study from Sakyi-Nyarko, Ahmad and Green (2022) examining the influence of financial inclusion on household well-being in Ghana. They consider the impact of financial inclusion on a set of dimensions of household well-being like improvement of food consumption, medical treatment and school attendance outcomes. They find evidence of beneficial effects of

financial inclusion. Our work differs from their study by focusing on life satisfaction as a whole and by adopting a cross-country perspective rather than being focused on one developing country.

Second, we extend the vast literature that examines the individual determinants of life satisfaction. Existing studies have identified a large set of individual factors like health or marital status (e.g., Deaton, 2008; Clark et al., 2017; Guriev and Melnikov, 2018). We augment the literature by emphasizing the influence of financial inclusion.

The paper proceeds as follows. Section 3.2 describes the data and methodology. Section 3.3 presents the results. Section 3.4 explores the channels and section 3.5 the moderating effects. Section 3.6 provides the robustness tests. Section 3.7 reviews our conclusions.

#### 3.2. Data and methodology

#### 3.2.1. Measuring financial inclusion and life satisfaction

To investigate our research question, we use individual data coming from the three waves (2006, 2010, and 2016) of the Life in Transition Survey (LiTS). The LiTS is an international program initiated in 2006 and conducted by the European Bank for Reconstruction and Development in collaboration with the World Bank. The survey covers former communist countries from Central and Eastern Europe and Central Asia, as well as some Western European countries for comparison. Its objective is to assess the impact of political, economic, and social changes on the lives of people in the regions surveyed. It asks representative samples of individuals in each country about a wide range of topics such as life conditions and perceptions. Our final sample includes 59,209 observations collected in 2006, 2010 and 2016 from 29 countries.

As traditionally measured in the literature (e.g., Demirgüç-Kunt, Klapper and Singer, 2017), we define financial inclusion as the ownership of a bank account. Our measure of financial inclusion is taken from the answers to the following questions of the surveys:

"Does anyone in your household have a bank account? Yes (1), No (2)." (LiTS 2006) "Do you or anyone in your household own a bank account? Cross whether that applies." (LiTS 2010)

"Do you have a bank or postal account? Yes, I have at least one account and I own at least one of them alone (1), Yes, I have at least one account but I own all of them jointly with someone else (2), No (3)." This question was asked to the primary and secondary respondents. (LiTS 2016)

The responses of the surveys have been recoded, so that the variable *Bank account* corresponds to a dummy variable taking the value one when the respondent or anyone in the household owns at least one bank account, and zero otherwise. For the question of the LiTS 2016, the first two choices have therefore been recoded as one and the last one as zero.

Since we investigate the impact of financial inclusion on life satisfaction, we need to take care to have enough variance in financial inclusion for each country-year. For instance, financial inclusion can be almost 100% of the population in some countries like Germany, which is meaningless for our investigation. To this aim, we have skipped from our sample each country-year for which the mean for *Bank account* was lower than 10% or higher than 90%. All country-year couples used in this study can be found in Table 3.2.

Life satisfaction is measured using the answers to the following question that remains similar in the three waves of the LiTS:

"To what extent do you agree with the following statement? All things considered, I am satisfied with my life now. Strongly disagree (1), Disagree (2), Neither disagree nor agree (3), Agree (4), Strongly agree (5)."

We define our dependent variable *Life satisfaction* with the answers to this question. *Life satisfaction* is an ordered variable taking values on a five-point scale.

#### **3.2.2.** Methodology

To perform our empirical investigation, we estimate OLS regressions in line with former works explaining life satisfaction with individual characteristics and using LiTS data (e.g., Djankov, Nikolova and Zilinsky, 2016; Guriev and Melnikov, 2018). We use the following model specification:

$$\begin{split} \textit{Life satisfaction}_i &= \alpha \ + \beta_1 \textit{Bank account}_i + \beta_2 \textit{Individual controls}_i \\ &+ \beta_3 \textit{PSU} - \textit{year fixed effects} + \varepsilon_i \end{split}$$

where *i* indexes the individual. We incorporate primary sampling unit PSU-year fixed effects: primary sampling units correspond to the region where the respondent lives. They are geo-administrative divisions provided by the Life in Transition Survey and specific to the wave of the survey (EBRD, 2016). We therefore account both for the characteristics of region and the year of the survey by including PSU-year fixed effects. We cluster standard errors by

country to address potential correlations between observations within the same country. Our sample includes 3,551 PSU- year.

We employ a large set of individual controls to isolate potential confounding factors based on former studies on life satisfaction (Guriev and Melnikov, 2018). *Female* controls for gender and assigns a value of one if the individual is a female, and zero otherwise. *Age/10* and  $Age^2/100$  account for the age of the respondent in years. *Education* is an ordered variable with values between zero and three, corresponding to the highest degree obtained by the individual. It is equal to zero for individuals having no degree nor education, one for those having compulsory or primary education, two for secondary education and three for tertiary or higher education. *Income* depicts the self-reported income level of the respondent, on a scale from one to ten, relative to other people in the country. *Income* is derived from the answers to the subsequent question:

"Please imagine a ten-step ladder where on the bottom, the first step, stand the poorest 10% people in our country, and on the highest step, the tenth, stand the richest 10% people in our country. On which step of the ten is your household today?"

*Married* captures the marital status of the individual and is equal to one if the respondent is married, and zero otherwise. *Urban* is a dummy variable equal to one when the individual lives in an urban area, and zero in a rural environment. *Health* corresponds to the self-assessed level of health of respondents on a five-point scale and is recoded so that five represents the greater level of health. The variable *Health* is based on the answer on the following question:

"How would you assess your health? Very good (1), Good (2), Medium (3), Bad (4), Very bad (5)."

*Family size* considers the number of individuals in the respondent's household. The variable is equal to ten when the household comprises ten or more members. We control for the employment status with the variable *Job*, a dummy variable equal to one when the individual has worked for income during the past year, and zero otherwise. *General trust* reflects the self-assessed degree of social trust on a five-point scale, that the respondent generally feels towards most people. It is coded with the answers to the question:

"Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please answer on a scale of 1 to 5, where 1 means that you have complete distrust and 5 means that you have complete trust."

To account for the ownership of the dwelling, we include *Property owner*, a dummy variable equal to one when the individual's dwelling is owned by a member of the household, and zero otherwise.

In addition, we also include one country control in some estimations: *GDP per capita*, corresponding to the logarithm of the real GDP per capita in the country during the survey year from the World Development Indicators, following Guriev and Melnikov (2018) using similarly LiTS data to explain life satisfaction. Regressions including PSU-year fixed effects already consider the characteristics of the region of the respondent at the time of the survey. Therefore, we only include *GDP per capita* and year fixed effects in the specifications without PSU-year fixed effects. Table 3.1 provides a summary of the descriptive statistics for all variables considered in the study.

#### 3.3. Results

In this section, we examine whether financial inclusion affects life satisfaction. We first provide a univariate analysis by country-year pair. We then present the results of the main estimations obtained with regressions.

#### 3.3.1. Univariate analysis

We launch the empirical investigation by performing a univariate analysis by countryyear pair. This approach offers insights about the impact of financial inclusion on life satisfaction across countries and years. To this end, we display the mean level of life satisfaction for individuals owning a bank account and for those who do not for each country-year pair in Table 3.2.

We find that financially included people have a significantly higher life satisfaction than non-financially included people in the vast majority of the country-year pairs (56 out of 59). In the three remaining country-year pairs, we never observe that non-financially included people have a significantly higher life satisfaction than financially included people. These findings tend to support a positive impact of financial inclusion on life satisfaction, while this conclusion is not conditional to the country or the year.

#### 3.3.2. Main estimations

Table 3.3 reports the results of the OLS regressions. We consider three different specifications to test the sensitivity of the results. All specifications include all individual control variables. In column (1), we include year fixed effects controlling for the year of the survey. In column (2), we again include year fixed effects and add *GDP per capita* to control

for macroeconomic changes at the country level. In column (3), we include PSU-year fixed effects.

We observe that *Bank account* is significantly positive in all specifications. Therefore, our key finding conclusion is that being financially included improves life satisfaction. We consequently support the hypothesis that financial inclusion is beneficial for life satisfaction. It corroborates the view that owning a bank account brings benefits for an individual, which can be in terms of convenience for financial transactions, of safety and confidentiality, and of easier access to credit, leading to a happier life.

For economic significance, we consider the coefficient of *Bank account* in the specification in column (3) including all controls and fixed effects. We observe that the level of life satisfaction increases by 0.134 points when the respondent is financially included. In comparison with the mean life satisfaction for the full sample (3.104), the effect of financial inclusion appears economically significant. Furthermore, financial inclusion has a greater economic effect on life satisfaction than some other socio-demographic characteristics. To be financially included has a positive effect on life satisfaction which is much larger than the effect of gender (to be a woman increases life satisfaction by 0.023 points) or the effect of education (a greater education leads to a rise of 0.049 for life satisfaction).

Regarding the control variables, their effects on life satisfaction are overall consistent with previous literature (Hayo, 2007; Djankov, Nikolova and Zilinsky, 2016; Guriev and Melnikov, 2018). We observe that the coefficient of *Female* is significant and positive, meaning greater happiness for women. The coefficients of Age/10 and  $Age^2/100$  are significant suggesting a non-linear effect of age: life satisfaction first diminishes until 49 years old and then increases with age. The coefficients of *Education, Income* and *Married* are positive and significant in all specifications. It means that more educated, high-income and married individuals are more satisfied in their life.

The coefficient of *Urban* is negative in all estimations but is not significant when we include PSU-year fixed effects, which may absorb the effect of *Urban*. This tends to indicate that living in an urban area may have a negative impact on life satisfaction. The coefficients of *Health*, *Job*, *Property owner* and *General trust* are always significant and positive. This provides evidence that healthier, working and more trusting people are happier in their life. As well, individuals owning their dwelling have better life satisfaction. We find an unclear effect of family size with a significantly coefficient which is negative depending on the inclusion of PSU-year fixed effects.

#### 3.4. Examining the channels

In this section, we question through which channels financial inclusion can improve life satisfaction. In accordance with the expected benefits from financial inclusion and the availability of data, we consider four factors through which financial inclusion can affect life satisfaction: health, education, the launch of a business, and the grant of a loan.

Regarding health, we examine the following hypothesis. Research on the consequences of financial inclusion has found that being financially included facilitates the access to medical treatment (Sakyi-Nyarko, Ahmad and Green, 2022) and improves mental health (Ajefu, Demir and Haghpanahan, 2020). Furthermore, former studies on the determinants of life satisfaction have shown evidence that a better health is positively associated with happiness (e.g., Singh, Kshtriya and Valk, 2023). Therefore, we suppose that financial inclusion can favor health, which improves life satisfaction in turn.

Concerning education, we hypothesize that financial inclusion fosters education, which has in turn a positive effect on life satisfaction. Financial inclusion can give easier access to credit, which helps for finance education-related expenses such as tuition fees or books and can facilitate transactions related to education. In addition, financial inclusion enhances namely school attendance (Sakyi-Nyarko, Ahmad and Green, 2022). As education has been shown to favor quality of human life (e.g., Hayo, 2007), financial inclusion can improve life satisfaction through higher education.

Regarding launching a business, we test the hypothesis that having a bank account helps individuals to launch a business, which can boost their satisfaction in life. Financial inclusion gives access to financial services enabling individuals to conduct financial transactions with greater efficiency and security and to ask for a loan. This can encourage people to create their business (Demirgüç-Kunt, Klapper and Singer, 2017). In turn, the launch of a business can be perceived as a sense of accomplishment and of achievement for the entrepreneur. A business can also yield money, which can enhance life satisfaction.

Finally, we test the hypothesis that being financially included increases the likelihood to borrow which can impact their life satisfaction. Having a bank account is a first step to access to other financial services proposed by a financial institution. Owning a bank account therefore increases the probability to obtain a loan (Demirgüç-Kunt, Klapper and Singer, 2017). We suppose that a credit can have a double-sided effect on happiness. On the one hand, a loan allows individuals to invest in goods and services that can improve their satisfaction in life. On

the other hand, the indebtedness situation due to the loan can cause troubles related to repayment issues, thus deteriorating happiness (Brown, Taylor and Price, 2005; Tay et al., 2017; Liu et al., 2020).<sup>15</sup> Therefore, getting a loan can mediate the positive effect of financial inclusion on happiness.

To explore these channels, we use the previously defined variables *Health* and *Education* and we define two new variables: *Business*, and *Loan*. Data for these two variables are available for LiTS II (2010) and LiTS III (2016) only. *Business* is a dummy variable equal to one when the respondents have managed to set up their own business, and zero otherwise. *Loan* is a dummy variable equal to one when the individual repays a loan for the purchase of his/her dwelling, and zero otherwise. We have excluded individuals repaying a loan but without bank account from the sample for more accuracy.

To test the mediation hypotheses, we use the structural equation modeling (SEM) / path analysis approach and conduct our structural equation model for each of the four mediators mentioned (*Health, Education, Business,* and *Loan*). In line with former studies using path analysis (Bentley-Goode, Omer and Twedt, 2019; Callen, Fang and Zhang, 2020), we perform regressions of life satisfaction on financial inclusion and on the tested mediating variable. Furthermore, we regress the mediator on financial inclusion. All regression equations incorporate all control variables and PSU-year fixed effects employed before. We employ the Sobel, Aroian and Goodman tests to assess the significance of the mediated effect, following Messersmith et al. (2011). Figure 1 depicts the structural equations model, along with the specific paths and their connections to life satisfaction as the outcome variable. Table 3.4 presents the results of the path analysis.

We first observe significantly positive direct path [ $p(Bank \ account, \ Life \ satisfaction)$ ] coefficients of *Bank account* on *Life satisfaction*, controlling for the mediator studied in all models. This verifies that financial inclusion improves life satisfaction in all models. The indirect path [ $p(Bank \ account, \ Mediator)$ ] coefficients between *Bank account* and the mediators are all significant and positive, supporting our hypotheses. Financial inclusion influences positively health, education, the launch of a business, and the grant of a loan. Then, the indirect path [ $p(Mediator, \ Life \ satisfaction)$ ] effects between the mediators and *Life satisfaction* are significant and positive for *Health*, *Education*, and *Business*. This means that health, education, and the launch of a business directly enhance happiness. For *Health* and

<sup>&</sup>lt;sup>15</sup> Consistent with this argument, Yue et al. (2022) have shown that the expansion of digital finance in China can favor financial inclusion but at the same time also increase the likelihood of financial distress for households.

*Education*, the mediated path [ $p(Bank \ account, \ Mediator)*p(Mediator, \ Life \ satisfaction)$ ] is indeed significantly positive with the three tests employed (Sobel, Aroian, and Goodman). This indicates that being financially included improves life satisfaction via a better health and a better education. More precisely, 3.82% of the positive effect of financial inclusion on life satisfaction goes through a better health. As well, the beneficial effect of financial inclusion on life satisfaction passes by a better education at 5.50%. The mediating effect of *Business* is slightly significantly positive with the Sobel and Goodman tests. 0.57% of the positive effect of being financially included, can be due to the launch of a business. These results corroborate our three first hypotheses about the mediation effects of health, education and the launch of a business. Finally, *Loan* has no direct significant impact on life satisfaction, and no significant mediating effect on life satisfaction, meaning that the beneficial effect of financial inclusion on life satisfaction is not mediated by the repayment of a debt.

In a nutshell, we find evidence that the effect of financial inclusion on life satisfaction takes place through three channels: health, education, and to a lesser extent through the launch of a business. Having a bank account increases the probability to have a better health, a better education and to launch a business, which in turn leads to a greater satisfaction in life. Furthermore, we find evidence that financial inclusion is not mediated by the repayment of a loan.

As explained above, we do not claim that these three channels are the only ones through which financial inclusion exerts an influence on life satisfaction. Based on former literature on the expected benefits of financial inclusion for individuals and data available in LiTS, we concentrated our investigation on four potential channels.

#### 3.5. Moderating variables

In this section, we complement our main results by examining whether they are affected by four moderating variables. We question whether these variables reduce or amplify the positive influence of financial inclusion on life satisfaction.

First, we examine whether gender affects the relation between financial inclusion and life satisfaction. We test the hypothesis that the positive impact of financial inclusion on life satisfaction is stronger for females relative to males. This hypothesis is motivated by the gender gap in financial inclusion: women are less financially included than men worldwide (Demirgüç-Kunt et al., 2018). Having a bank account can be therefore especially valuable for

females, benefiting from greater confidentiality and control over their income and savings (Demirgüç-Kunt, Klapper and Singer, 2017). Financial inclusion can hence strengthen women's empowerment improving their satisfaction in life.

Second, we consider the influence of GDP per capita on the effect of financial inclusion on life satisfaction. We assume that a greater income per capita amplifies the effect. Indeed, cross-country literature about financial inclusion has found evidence that GDP per capita positively influences the level of financial inclusion in a country (Sha'ban, Girardone and Sarkisyan, 2020). In countries with higher GDP per capita, individuals are therefore more likely to make transactions requiring a bank account, such as wire transfers or transactions with credit card. Thus, non-financially included individuals in these countries are marginalized and face difficulties to deal with others, which can hamper their life satisfaction.

Third, we investigate the influence of bank concentration on the relation between financial inclusion and life satisfaction. We test the hypothesis that higher bank concentration moderates the beneficial impact of financial inclusion on life satisfaction. The rationale behind this hypothesis is that higher bank concentration allows banks charging higher prices for services to customers. Consequently, individuals can benefit less from their bank account.

Fourth, we consider the impact of the occurrence of a financial crisis. We assume that such an event moderates the positive effect of financial inclusion on life satisfaction. The reason is that a financial crisis hits more financially included people since they can lose their savings.

To test these hypotheses, we redo the regressions by adding an interaction term between the tested factor and *Bank account*. To investigate the influence of gender and of *GDP per capita*, we use previously defined variables *Female* and *GDP per capita*. To examine the impact of bank concentration, we define the variable *Bank concentration* corresponding to the assets of the five largest banks as a share of total commercial banking. Data come from the Global Financial Development Database. The sample is slightly smaller when considering bank concentration since this variable is missing for Kosovo. To analyze the influence of the occurrence of a financial crisis, we define *Financial crisis* as a dummy variable equal to one when a financial crisis took place in the country of the respondent during the five years before the survey year, and zero otherwise. Information on financial crises comes to the Systemic Banking Crises Database II (Laeven and Valencia, 2020).

Table 3.5 provides the results for the moderating variables. We use the specification with all controls and PSU-year fixed effects in all estimations. First, we find no evidence that the positive impact of financial inclusion on life satisfaction would differ between men and women. The coefficient of *Female*  $\times$  *Bank account* is not significant. Therefore, we do not

support the hypothesis that women would benefit from financial inclusion in terms of life satisfaction. Second, we show that GDP per capita affects the relation between financial inclusion and life satisfaction with the significantly positive coefficient of *GDP per capita* × *Bank account*. It accords with our hypothesis that the beneficial effect of financial inclusion on life satisfaction is amplified by income per capita. Third, we find evidence that bank concentration does not affect the relation between financial inclusion and life satisfaction: the coefficient of *Bank concentration* × *Bank account* is not significant. It does not confirm the hypothesis that greater bank concentration moderates the beneficial impact of financial inclusion on life satisfaction. Fourth, we point out a significantly negative coefficient for *Financial crisis* × *Bank account*. It supports the hypothesis according to which the occurrence of a financial crisis recues the benefits associated with financial inclusion for individuals.

To sum it up, our findings show that the impact of financial inclusion on life satisfaction is higher in countries with higher income per capita, lower in countries with higher bank concentration and a recent occurrence of a financial crisis.

#### 3.6. Robustness checks

This section presents robustness tests to examine the sensitivity of our findings. We first provide an instrumental variable analysis. We then use alternative estimation models with logistic regressions. We finally check whether the results hold when considering each survey year separately.

#### **3.6.1 Instrumental variable approach**

We are aware that our main results might be confounded by a potential endogeneity problem. Reverse causality could exist with a positive influence of life satisfaction on financial inclusion. Furthermore, we could have some omitted variables that simultaneously affect financial inclusion and life satisfaction. In our regressions, we included a large number of control variables in addition to PSU-year fixed effects to partially address unobserved endogeneity concerns.

We tackle the potential endogeneity problem by running the two-stage (2SLS) IV regression between financial inclusion and life satisfaction. The instrument is *Mean PSU bank account*, corresponding to the mean financial inclusion in the PSU of the individual excluding his/her own level of financial inclusion from the calculation. Financial inclusion in the region

is expected to be related to financial inclusion of the individual, in line with evidence of the influence of peers on the use of financial services (Patacchini and Rainone, 2017). At the same time, no theoretical association can be conjectured between mean financial inclusion in the region and life satisfaction of the individual. We exclude from the estimations the PSUs with only one observation.

Table 3.6 displays the first-stage estimations and the second-stage regressions. Since we use the mean financial inclusion of the respondent's PSU-year as instrument, we do not add PSU-year fixed effects in our instrumental variable models: PSU-year fixed effects accounting for the characteristics of the respondent's PSU at the time of the interview may absorb the effect of our instrument Mean PSU bank account. Thus, we replace PSU-year fixed effects by country fixed effects for these estimates. Our two specifications include individual controls, year fixed effects and country fixed effects to account for the time-invariant characteristics of the country. We further control for GDP per capita in specification (2). The sizeable and significant Cragg-Donald Wald F-statistics indicate that Mean PSU bank account has a strong effect on Bank account: the level of the average regional financial inclusion influences the likelihood of the individual's financial inclusion. This supports the view that Mean PSU bank account is a relevant instrument for the study. Moreover, regional financial inclusion excluding the individual does not directly explain the individual's life satisfaction, we can therefore consider it as a valid instrument. The Durbin-Wu-Hausman endogeneity test was used to assess the endogeneity of financial inclusion. The tests are insignificant suggesting that our OLS estimates are consistent and efficient. The first-stage results reveal a statistically significant and positive association between Mean PSU bank account and Bank account. This means that an individual belonging to a region with a high level of financial inclusion is more likely to be financially included. This corroborates the choice of our instrument.

Results from the second-stage regressions are in line with the main estimations. We still find a positive and significant coefficient for *Bank account* in all regressions. This indicates that having a bank account does improve life satisfaction. Therefore, the results suggest that the positive relation between financial inclusion and life satisfaction is not driven by an endogeneity bias.

#### 3.6.2. Logistic regressions

As our dependent variable *Life satisfaction* is a discrete variable, we further complement our robustness tests by estimating logistic regressions. We test the same three specifications as before. First, we consider an ordered logit model to explain *Life satisfaction*.

Table 3.7 reports the estimations. We find again that *Bank account* is significantly positive in all estimations. Second, we use a logit model to explain *Life satisfaction dummy*, a dummy variable equal to one if individuals positively answer to the question on life satisfaction by replying "*Agree*" or "*Strongly agree*", and equal to zero otherwise. Guriev and Melnikov (2018) consider a similar measure in their work. Table 3.8 displays the estimations. We obtain the same results than in the main estimations with a positive and significant coefficient for *Bank account* in all estimations. Hence, the use of logistic regressions corroborates our finding that financial inclusion improves happiness.

#### 3.6.3. Estimations by year

We redo the estimations by survey year. These estimations are motivated by two reasons. First, we want to investigate whether our findings are not specific to one period. Second, we aim at accounting for the potential bias arising from the slight differences in survey questions.

Table 3.9 displays the estimations. We present the results for the model including all individual control variables and PSU-year fixed effects for each survey year. We find that *Bank account* is significantly positive for each survey year. Therefore, our conclusion of a beneficial impact of financial inclusion on life satisfaction is observed for each survey year.

#### **3.7.** Conclusion

This paper addresses the issue of the impact of financial inclusion on life satisfaction. Using a cross-country dataset at the individual level, we find that financial inclusion improves life satisfaction. This result still holds when conducting various robustness checks, such as instrumental variable analysis, alternative estimation models, or the inclusion of regional fixed effects.

We further document that the effect of financial inclusion is channeled through education, health, and to a lesser extent through the launch of a business. Being financially included increases the probability to have a better education, a better health, and to launch a business, resulting in greater life satisfaction. Additionally, we observe that the positive impact of financial inclusion on life satisfaction differs with the country characteristics. It is higher in countries with higher income per capita, and lower in countries struck by a recent financial crisis. Our results add to the research knowledge about the effects of financial inclusion and to the determinants of life satisfaction. From a policy standpoint, the results of this study provide an additional motivation to promote financial inclusion worldwide. Policymakers should foster financial inclusion not only to reach economic goals but also to bring happiness to people.

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### **Tables and Figures**

## Table 3.1.Descriptive statistics

This table reports the descriptive statistics for the variables employed in this study.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Life satisfaction	59,209	3.104	1.132	1	5
Life satisfaction dummy	59,209	0.440	0.496	0	1
Bank account	59,209	0.531	0.499	0	1
Female	59,209	0.572	0.495	0	1
Age/10	59,209	4.716	1.722	1.8	9.9
Age <sup>2</sup> /100	59,209	25.210	17.208	3.24	98.01
Education	59,209	2.013	0.703	0	3
Income	59,209	4.397	1.746	1	10
Married	59,209	0.583	0.493	0	1
Urban	59,209	0.594	0.491	0	1
Health	59,209	3.643	0.848	1	5
Family size	59,209	2.932	1.625	1	10
Job	59,209	0.536	0.499	0	1
Property owner	59,209	0.868	0.338	0	1
General trust	59,209	2.793	1.123	1	5
GDP per capita	59,209	9.662	0.534	8.036	10.661
Bank concentration	57,625	76.826	12.406	49.184	100
Financial crisis	59,209	0.248	0.432	0	1
Business	40,457	0.093	0.291	0	1
Loan	33,341	0.047	0.213	0	1

#### Table 3.2. Univariate analysis

This table provides the mean level of life satisfaction by country and by year, comparing individuals having a bank account and the others. The p-value is based on a two-sided test and gives the probability that the two means are equal. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Country	Year	Observations	Bank account $= 0$	Bank account = 1	Difference	
Albania	2006	974	3.156	3.707	0.551	***
Albania	2010	928	2.978	3.309	0.331	***
Albania	2016	1,070	3.061	3.528	0.467	***
Armenia	2016	1,245	2.189	2.595	0.406	***
Bosnia and Herzegovina	2006	948	2.471	2.896	0.425	***
Bosnia and Herzegovina	2010	931	2.691	3.108	0.417	***
Bulgaria	2006	959	2.650	3.260	0.610	***
Bulgaria	2010	785	2.769	3.082	0.313	***
Bulgaria	2016	1,179	2.259	3.044	0.785	***
Belarus	2006	893	3.629	3.762	0.133	*
Belarus	2010	805	3.343	3.511	0.167	*
Belarus	2016	1,367	2.858	3.157	0.299	***
Kosovo	2010	875	3.191	3.526	0.335	***
Kosovo	2016	709	2.746	3.204	0.459	***
Croatia	2006	924	2.673	3.505	0.832	***
Croatia	2010	907	2.766	3.305	0.539	***
Czech Republic	2006	947	3.105	3.603	0.498	***
Estonia	2010	939	3.000	3.348	0.348	***
Georgia	2016	1,122	2.580	2.954	0.374	***
Hungary	2006	968	2.378	2.781	0.403	***
Hungary	2010	1,028	2.231	2.601	0.370	***
Hungary	2016	1,249	2.602	2.970	0.367	***
Italy	2010	1,012	2.699	3.330	0.631	***
Kazakhstan	2006	951	3.373	3.510	0.136	
Kazakhstan	2010	892	3.202	3.469	0.266	**
Kazakhstan	2016	1,086	3.389	3.722	0.333	***
Kyrgyz Republic	2016	806	3.763	3.690	-0.073	
Latvia	2006	986	3.008	3.472	0.464	***
Latvia	2010	952	2.507	2.993	0.486	***
Lithuania	2006	994	2.914	3.496	0.582	***
Lithuania	2010	908	2.778	2.986	0.208	**
Mongolia	2006	871	3.019	3.417	0.398	***
Mongolia	2010	838	3.166	3.557	0.391	***
Moldova	2016	1,083	2.624	2.798	0.174	*
Montenegro	2006	855	2.625	2.965	0.340	***

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Montenegro	2010	791	2.998	3.275	0.277 ***
Montenegro	2016	955	2.878	3.325	0.446 ***
Poland	2006	951	3.030	3.493	0.463 ***
Poland	2010	1,489	3.096	3.597	0.501 ***
Poland	2016	1,321	3.267	3.498	0.230 ***
Romania	2006	941	2.709	3.353	0.644 ***
Romania	2010	904	2.356	2.683	0.327 ***
Romania	2016	1,195	2.907	3.375	0.468 ***
Slovak Republic	2006	925	3.054	3.547	0.493 ***
Slovak Republic	2016	1,280	2.921	3.341	0.420 ***
Tajikistan	2016	805	3.969	3.928	-0.042
Turkey	2006	969	3.009	3.355	0.346 ***
Turkey	2010	955	3.126	3.471	0.344 ***
Turkey	2016	780	3.000	3.173	0.173 *
Ukraine	2006	960	2.840	3.447	0.607 ***
Ukraine	2016	1,304	2.645	2.769	0.124 *
North Macedonia	2006	877	2.543	3.022	0.479 ***
North Macedonia	2010	1,020	2.722	2.917	0.195 ***
Russia	2006	925	3.081	3.325	0.244 ***
Russia	2010	1,355	3.070	3.394	0.324 ***
Russia	2016	1,200	2.868	3.068	0.200 ***
Uzbekistan	2016	992	4.190	4.291	0.101 **
Serbia	2006	934	2.433	2.690	0.257 ***
Serbia	2010	1,395	2.581	2.877	0.295 ***
Total		59,209	2.941	3.249	0.308 ***

## Table 3.3.Main estimations

This table presents the results of OLS regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.122**	0.120**	0.134***
	(0.050)	(0.050)	(0.014)
Female	0.046***	0.046***	0.023**
	(0.014)	(0.014)	(0.009)
Age / 10	-0.274***	-0.275***	-0.253***
	(0.038)	(0.036)	(0.026)
Age <sup>2</sup> / 100	0.028***	0.028***	0.026***
	(0.004)	(0.004)	(0.003)
Education	0.095***	0.096***	0.049***
	(0.022)	(0.021)	(0.009)
Income	0.198***	0.198***	0.212***
	(0.010)	(0.010)	(0.008)
Married	0.131***	0.131***	0.130***
	(0.016)	(0.016)	(0.011)
Urban	-0.052*	-0.052*	-0.125
	(0.026)	(0.026)	(0.136)
Health	0.114***	0.114***	0.111***
	(0.018)	(0.018)	(0.010)
Family size	0.029	0.030	-0.009*
	(0.019)	(0.019)	(0.004)
Job	0.073**	0.073**	0.054***
	(0.027)	(0.028)	(0.016)
Property owner	0.074***	0.075**	0.106***
	(0.023)	(0.028)	(0.014)
General trust	0.130***	0.130***	0.107***
	(0.011)	(0.010)	(0.005)
GDP per capita		0.007	
		(0.091)	
Year FE	Yes	Yes	No
PSU-year FE	No	No	Yes
Observations	59,209	59,209	59,209
Adjusted R-squared	0.184	0.184	0.361

### Table 3.4.Mediation effects

This table presents the results from the path analysis depicted in Figure 1. Four mediating variables are tested: *Health, Education, Business* and *Loan*. Direct, mediated and total mediated paths are displayed. Sobel, Aroian and Goodman tests are used to assess the significance of the total mediated path. *Percentage* represents the proportion of the total effect of *Bank account* on *Life satisfaction* that is mediated by the variable studied. It is equal to the total mediated effect over the sum of the total mediated effect and the direct effect of *Bank account* on *Life satisfaction*, controlling for the mediator, in percentage. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Mediator	Health	Education	Business	Loan
Direct path				
p(Bank account, Life satisfaction)	0.134***	0.134***	0.126***	0.126***
	(0.014)	(0.014)	(0.015)	(0.017)
Mediated path for Mediator				
p(Bank account, Mediator)	0.048***	0.161***	0.019***	0.054***
	(0.015)	(0.012)	(0.006)	(0.009)
p(Mediator, Life satisfaction)	0.111***	0.049***	0.038*	-0.048
	(0.010)	(0.009)	(0.020)	(0.011)
Total mediated path				
p(Bank account, Mediator)*p(Mediator, Life satisfaction)	0.005	0.008	0.001	-0.003
Sobel statistic	2.991***	4.857***	1.652*	-1.214
	(0.002)	(0.002)	(4.368e-04)	(0.002)
Aroian statistic	2.980***	4.845***	1.596	-1.197
	(0.002)	(0.002)	(4.522e-04)	(0.002)
Goodman statistic	3.002***	4.869***	1.715*	-1.231
	(0.002)	(0.002)	(4.208e-04)	(0.001)
Percentage	3.82%	5.50%	0.57%	
Individual controls	Yes	Yes	Yes	Yes
Country control	No	No	No	No
Year FE	No	No	No	No
PSU-year FE	Yes	Yes	Yes	Yes
Observations	59,209	59,209	40,457	33,341

## Table 3.5.Moderating effects

This table presents the results of OLS regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Female × Bank account	2.156e-04			
	(0.016)			
GDP per capita × Bank account		0.090**		
		(0.034)		
Bank concentration × Bank account			3.899e-04	
			(0.001)	
Financial crisis × Bank account				-0.063***
				(0.023)
Bank account	0.134***	-0.706**	0.109	0.149***
	(0.015)	(0.328)	(0.077)	(0.016)
Female	0.023*	0.038***	0.021**	0.023**
	(0.012)	(0.010)	(0.009)	(0.009)
GDP per capita		-0.003		
		(0.353)		
Bank concentration			-0.042***	
			(0.002)	
Financial crisis				0.432***
				(0.024)
Year FE	No	Yes	No	No
PSU-year FE	Yes	No	Yes	Yes
Country FE	No	Yes	No	No
Observations	59,209	59,209	57,625	59,209
Adjusted R-squared	0.361	0.240	0.359	0.361

### Table 3.6.Instrumental variable estimates

This table presents the results of instrumental variable models. The upper part of the table displays the results of the second stage regression. *Bank account* is instrumented by *Mean PSU bank account*. The dependent variable is *Life satisfaction*. The lower part of the table shows the results of the first-stage regression with the dependent variable *Bank account*, as well as the instrument test, and the endogeneity test. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)
Bank account	0.211***	0.212***
	(0.059)	(0.060)
Individual controls	Yes	Yes
Country control	No	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Observations	59,195	59,195
Adjusted R-squared	0.239	0.239
First-stage		
Mean PSU bank account	0.791***	0.790***
	(0.016)	(0.016)
Instrument test		
Cragg-Donald Wald F-statistic	2,419.46***	2,496.96***
Endogeneity test		
Durbin-Wu-Hausman test statistic	1.179	1.151

## Table 3.7.Ordered logit regressions

This table presents the results of ordered logit regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.212**	0.209**	0.270***
	(0.092)	(0.092)	(0.028)
Individual controls	Yes	Yes	Yes
Country control	No	Yes	No
Year FE	Yes	Yes	No
PSU-year FE	No	No	Yes
Observations	59,209	59,209	59,209
Pseudo R-squared	0.070	0.070	0.178
## Table 3.8.Logit regressions

This table presents the results of logit regressions. The dependent variable is *Life satisfaction dummy*. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.231**	0.217***	0.313***
	(0.101)	(0.019)	(0.039)
Individual controls	Yes	Yes	Yes
Country control	No	Yes	No
Year FE	Yes	Yes	No
PSU-year FE	No	No	Yes
Observations	59,209	59,209	56,347
Pseudo R-squared	0.100	0.100	0.253

## Table 3.9.Estimations by year

This table presents the results of OLS regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.145***	0.113***	0.134***
	(0.022)	(0.014)	(0.025)
Individual controls	Yes	Yes	Yes
Country control	No	No	No
Year FE	No	No	No
PSU-year FE	Yes	Yes	Yes
Observations	18,752	19,709	20,748
Adjusted R-squared	0.343	0.335	0.403

#### Figure 3.1. Paths between financial inclusion and life satisfaction

This figure illustrates both the direct and indirect paths through which financial inclusion (*Bank account*) potentially impacts life satisfaction. To examine these paths, a structural equation model (SEM) is employed to estimate the following system of equations below. The path coefficient  $\beta_1$  between *Bank account* and *Life satisfaction* represents the direct effect of *Bank account* on *Life satisfaction*, while controlling for the mediator of interest. The path coefficients  $\gamma_1$  and  $\beta_2$  between *Bank account* and the mediator and between the mediator and *Life satisfaction* respectively, indicate the indirect mediating effect of the mediator on the relationship between *Bank account* and *Life satisfaction*. The composite coefficient  $\gamma_1 \times \beta_2$  quantifies this indirect effect.

The path analysis is conducted using the following system of equations :

Life satisfaction =  $\beta_0 + \beta_1 Bank account + \beta_2 Mediator + \beta_3 Individual and country controls + <math>\beta_4 PSU - year + \varepsilon$ 

 $Mediator = \gamma_0 + \gamma_1 Bank \ account + \gamma_2 Individual \ and \ country \ controls + \gamma_3 \ PSU - year \ fixed \ effects + \epsilon$ 



### Chapter 4<sup>16</sup>

### **Does Female Bank Leadership Affect Firm Credit?**<sup>+</sup>

#### Abstract

This study examines how female bank leadership influences firms' bank debt. We combine bank-level and firm-level data to construct a sample of about 116,000 firms from eleven European countries. We hypothesize that higher female bank leadership leads to lower firms' bank debt, consistent with the view of higher risk aversion for women relative to men. We find that female bank leadership reduces firms' bank debt. This effect varies with the maturity of bank debt, as female bank leadership contributes to lower long-term bank debt but higher short-term bank debt. We also find that female bank leadership exerts a lower detrimental impact on firms' bank debt for female-led companies. Overall, our results indicate that greater female bank leadership can hamper access to credit of firms.

**JEL Codes**: D22 • G21 • G41

Keywords: banking • gender • access to credit

<sup>&</sup>lt;sup>16</sup> This chapter is co-written with Laurent Weill and is under review at the European Journal of Finance.

<sup>&</sup>lt;sup>+</sup> We thank Florian Léon for his very valuable comments and suggestions.

#### 4.1. Introduction

A large movement in European countries has taken place in the recent years to foster female representation on corporate boards. Many European countries, such as Norway, France, and the Netherlands, have introduced gender quotas. In the EU, the policy on gender balance in corporate boards has recently gone a step further with the political agreement reached by the European Parliament and the Council in June 2022. This directive, which requires at least 40% of non-executive board members of listed companies to be women from 2026, is part of a global commitment to promote equal opportunities between genders.

In the case of banking in Europe, top management is still a man's world<sup>17</sup>. However, gender quota legislations in Europe have increased the percentage of women on bank boards to 38% by 2022<sup>18</sup>. As banks play an important role in the economy through their financings, it is therefore important to know whether higher female bank leadership has an impact on economic outcomes.

A strand of literature has thus examined the influence of female leaders on bank risk and on bank performance in various countries, with three main findings. First, it tends to show lower levels of risk-taking for banks with higher presence of women in top management (Palvia, Vähämaa and Vähämaa, 2015; Dong, Girardone and Kuo, 2017; Palvia, Vähämaa and Vähämaa, 2020). Second, it concludes to higher profitability for banks with higher presence of women in top management (Reinert, Weigert and Winnefeld, 2016; Dong, Girardone and Kuo, 2017; Farag and Mallin, 2017; Baselga-Pascual and Vähämaa, 2021). Third, previous literature shows that female bank leadership affects bank credit supply, such as bank credit growth (Ararat, Armağan, and Bertay, 2023), green lending (Gambacorta et al., 2022) and cost of debt for microfinance institutions (Mia et al., 2022).

Surprisingly, no study has ever investigated the impact of female bank leadership on firms' access to credit. Indeed, the works that focus on the effects of bank gender diversity consider how female bank leadership affects the risk-performance and the lending profile of banks but ignore its influence on borrowers.

<sup>&</sup>lt;sup>17</sup><u>https://www.bloomberg.com/news/articles/2023-09-11/several-european-banks-have-no-female-top-execs-study-finds?embedded-checkout=true</u>

<sup>&</sup>lt;sup>18</sup> In comparison, in all sectors, 19.7% of corporate board seats were held by women, and 5.0% of CEOs were women worldwide in 2021, according to the last study led by Deloitte in 2022. This study is available at: <u>https://www.deloitte.com/global/en/services/risk-advisory/research/women-in-the-boardroom-seventh-edition.html</u>

Access to bank credit is crucial for firms, especially in Europe where bank financings represent the vast majority of firm financings. Without access to bank credit, firms are unable to undertake worthwhile projects and consequently cannot take advantage of all investment opportunities. Consequently, lack of access to bank credit limits firm growth and hinders economic growth. It is thus of prime interest to know the impact of female bank leadership on bank credit at the firm level. In this paper, we provide the first empirical investigation of the impact of female bank leadership on firms' bank debt.

The effect of the gender of bank directors and managers on firms' bank debt is far from obvious. A first view argues that higher female bank leadership would be detrimental to firm access to bank credit. As emphasized above, previous literature shows that more women in bank management leads to lower risk-taking. This finding can be explained by the higher risk aversion of women compared to men (Barber and Odean, 2001; Croson and Gneezy, 2009). Higher risk aversion of women should lead to tighter credit policies at the bank level, resulting in less access to credit for firms. In other words, the blessing of higher female bank leadership through lower risk-taking can become a curse when it comes to firms' access to bank credit.

An opposing view can however be proposed according to which banks with higher female bank leadership could promote access to credit. It is based on a number of arguments. First, a large strand of literature in psychology supports the view that women exhibit more prosocial behavior with greater empathy (Kamas and Preston, 2021) and altruism (Cox and Deck, 2007). These prosocial traits can lead female top management to adopt more lenient lending policies. Furthermore, the finding of higher profitability for banks with more female presence on top management has been explained by the benefits of greater diversity with female leaders bringing their different backgrounds and opinions. According to this argument, female-led banks can implement lending policies that target a wider audience thanks to the different experience of female leaders. Finally, the higher profitability of banks with more female presence in top management can increase the bank's equity and thus encourage greater bank lending by easing capital constraints.

We test which view dominates empirically in a large cross-country dataset of firms. To conduct our investigation, we model firm-level bank debt as a function of female bank leadership and a set of firm- and country-level control variables. A central challenge in analyzing this impact is to obtain firm-level information on the lending banks so that female leadership at the bank level can be linked to bank debt at the firm level. We have this information from the Amadeus database, which allows us to identify which bank lends to each borrowing firm. Thus, we can combine firm-level data from the Amadeus database with banklevel data from the Bankfocus database to construct a large sample of about 116,000 firms from eleven European countries.

By way of preview, we find that higher female bank leadership has a negative effect on firms' bank debt. The effect is also economically significant - a one-standard deviation increase in female bank leadership produces a 0.43 percentage point decrease in firms' bank debt, a 2.01% decrease from the mean. Our results are robust to a variety of other checks, including controlling for endogeneity and sample composition. These results are consistent with the view that higher female bank leadership is detrimental to firms' access to bank credit.

We also test whether the effect of female bank leadership is different for short-term bank debt and long-term bank debt. These two forms of bank debt are associated with different levels of risk from the bank's perspective and different uses from the borrowing firm's perspective. We find that female bank leadership has a negative effect on long-term bank debt but a positive effect on short-term bank debt. The more negative effect on long-term bank debt is consistent with the higher risk associated with this form of debt.

We further investigate whether female bank leadership leads to greater lending to firms headed by a female CEO, consistent with evidence of own-gender preferences in the supply of credit (Beck, Behr and Madestam, 2018). We find evidence that the negative effect of female bank leadership on firms' bank debt is only observed for firms headed by men.

Finally, we test the hypothesis that firm size and firm performance, which are associated with lower risk, reduce the negative effect of female bank leadership on firms' bank debt. We find that larger firms are less negatively affected by female bank leadership for their access to bank debt, but conclude that there is no effect of firm performance.

Our research contributes to two strands of the literature. First, we deepen the literature on the consequences of female bank leadership. Previous studies have shown that banks with more women among their directors are more stable (Palvia, Vähämaa, and Vähämaa, 2020; de Cabo, Gimeno and Nieto, 2012; Gulamhussen and Santa, 2015), perform better (García-Meca, García-Sánchez and Martínez-Ferrero, 2015; Baselga-Pascual, and Vähämaa, 2021; Gulamhussen and Santa, 2015; Pathan and Faff, 2013), and are more likely to have growth orientation (de Cabo, Gimeno and Nieto, 2012). Other papers also analyze the effect of bank female leadership on bank credit supply and find that higher female bank leadership affects bank credit growth (Ararat, Armağan and Bertay, 2023), fosters green lending (Gambacorta et al., 2022), and decreases the costs of debt for microfinance institutions (Mia et al., 2022). While

these papers focus on the effects for the banks, we are the first to address the consequences of female bank leadership on firms' bank debt.

Second, our paper contributes to the literature on the determinants of firms' access to credit. Previous literature has provided evidence that firm characteristics, such as the gender of the owner (Asiedu et al., 2013), banking characteristics, such as bank financial conditions (Popov and Udell, 2012), or banking sector characteristics, such as the presence of foreign banks (Clarke, Cull and Pería, 2006), can affect their access to credit. We extend this literature by examining the effect of female bank leadership on firms' access to credit.

This paper is structured as follows. Section 4.2 presents the data used and the methodology employed in the study. Section 4.3 lays out our main findings and the robustness checks. Section 4.4 provides additional results. Section 4.5 concludes.

#### 4.2. Data and methodology

#### 4.2.1. Data

To investigate the relationship between female bank leadership and firm, we combine firm- and bank-level data. Firm-level data come from the Amadeus database gathering financial information about private and public companies across Europe. Our dataset includes unconsolidated financial statements to avoid duplicating firms and their subsidiaries or international operations, while excluding firms only providing consolidated financial statements. Following the literature (e.g., Shamshur and Weill, 2019, 2023), we also exclude firms in the financial intermediation and insurance sectors (classified under NACE codes 64-66).

Bank-level data are taken from the Bankfocus database, containing information about bank financials. Amadeus database provides information about the name of the lending bank for each firm. We only keep firms with one lending bank to ensure that firms' loans are uniquely granted by the indicated bank. We match Amadeus and Bankfocus databases by checking the identity of the bank from Amadeus and searching it in Bankfocus. To do so, we take advantage from the new Bankfocus' tool called "Batch search". It allows to associate a bunch of bank names from Amadeus to their Bankfocus identification number and to create the sample of the matched banks. Since the Bankfocus identification number of the bank could refer to multiple bank statements in Bankfocus, we only keep banks with unconsolidated accounts, so that the bank from Amadeus matches only with one bank in Bankfocus. The sample created by the batch search allows then to easily extract the financial data of the banks matched from Bankfocus. Our final sample gathers data of 1,087 banks.

Information about the lending bank of the firm in Amadeus and the gender of bank directors and managers in Bankfocus is only available for the last wave. We therefore have a cross-section of firms for the year 2022. As well, we focus on the 11 European countries for which this information is available: Austria, Denmark, France, Germany, Greece, Ireland, Luxembourg, Netherlands, Portugal, Spain, and United Kingdom. This country sample is the best we can study: it gathers developed countries with women in bank top management, but also contains various countries in terms of culture and quotas legislations, allowing heterogeneity in the proportion of females as bank directors and managers. The sample composition is in line with previous research using Amadeus database (e.g., Shamshur and Weill, 2023). To have a consistent sample, we exclude the few firms that have a bank in a country where we had only one to three banks in the sample. The final sample includes banks located in the same 11 European countries as the firms, plus Switzerland and Monaco. Table 4.2 presents the distribution of our explanatory variable of interest *Bank female leaders* by country.

To measure the presence of women in bank top management, we construct the variable Bank female leaders. It is defined as the share of women in top management (directors and managers) of the bank in percentage. Directors and managers are a wide range of individuals working in several executive committees or boards and in various departments, such as administration, finance and accounting, customer services, marketing, legal and compliance or human resources. Bankfocus therefore provides information on a large array of positions and roles in several departments and hierarchical levels, which allows us to create a representative variable for the proportion of female leaders in the bank. As our sample covers only firms with a single bank, the firms of our sample are not large companies, so their loans have not overall high amounts. Therefore, the lending decision at the bank may not be taken at top leadership positions, but is decided at lower hierarchical levels of decision. Opting for the proportion of female leaders rather than CEO's gender or the feminization of the board of directors, is therefore more appropriate with the firm data. Moreover, the study by Ararat, Armağan, and Bertay (2023) shows that the proportion of women in the bank's global workforce affects bank credit growth, which supports the use of the global proportion of female leaders. This is also much more representative of the feminization of the top management of the bank since it encompasses several departments and several hierarchical levels.

To measure firm bank debt, we define our main dependent variable *Firm bank debt* as the ratio of short-term bank debt and long-term bank debt to total assets at the firm level. We winsorize this variable at the 5<sup>th</sup> and 95<sup>th</sup> percentiles to deal with abnormal extreme values of the collected data, following previous literature (e.g., Popov and Roosenboom, 2013). Our final sample contains 116,782 firm-level observations.

#### 4.2.2. Methodology

To undertake our work, we estimate OLS regressions with the following model: *Firm bank debt* 

> $= \alpha + \beta_1 Bank female leaders + \beta_2 Firm controls$ +  $\beta_3 Country controls + \beta_4 Bank controls + \beta_5 Industry fixed effects$ +  $\varepsilon$

We include industry fixed effects corresponding to the statistical classification of economic activities in the European community (NACE) in all specifications. We use the twodigit NACE codes to control for unobserved heterogeneity across different industries that can affect *Firm bank debt*.

We use a large set of control variables to isolate the effect of *Bank female leaders* and mitigate a potential omitted variable bias, based on previous research matching datasets on firms and banks (Shamshur and Weill, 2019, 2023). We control for firm characteristics with *Firm size, Firm ROA* and *Firm tangibility. Firm size* is equal to the natural logarithm of firm total assets to control for the size of the firm, since firms with different size can have different financing patterns. We use the log function to mitigate the high skewness in the variable, as traditionally done in the literature (e.g. Shamshur and Weill, 2019, 2023). *Firm ROA* corresponds to firm profit divided by total assets in percentage, to control for firm performance. Firms with higher profitability can have easier access to credit as they generate more cash flow to reimburse their debt. We also add *Firm tangibility*, equal to the ratio of firm tangibles divided by total assets, in percentage. Tangibles can serve as collateral for loans and can therefore facilitate the access to credit.

We add country controls to account for country-specific factors that might influence the dependent variable. We take into account the macroeconomic conditions of the country with *GDP per capita* and *Inflation*, extracted from the World Development Indicators. *GDP per capita* is equal to the natural logarithm of GDP per capita, while *Inflation* is the consumer price index in percentage. *Private credit to GDP* measures the development of the banking sector as

the ratio of private credit by deposit money banks and other financial institutions to GDP in percentage, coming from the Global Financial Development Database.

Finally, our model includes bank controls to consider bank-specific factors that might affect the bank lending behavior. *Bank size* corresponds to the natural logarithm of bank total assets. *Bank loans to assets* considers the specialization of the bank and is equal to the ratio of gross loans and advances to customers to total assets, in percentage. *Bank equity to assets* measures bank financial stability and is defined as the ratio of bank total equity to bank total assets, in percentage.

All firm- and bank-level financial variables have been winsorized at the 5% and 95% levels to deal with extreme abnormal values, as commonly done in the literature using Amadeus and Bankfocus databases (e.g., Popov and Roosenboom, 2013; Lavery, Spaliara and Tsoukas, 2022; Chaffai and Coccorese, 2023). Descriptive statistics of the variables are presented in Table 4.1. The correlation table is provided in Table 4.3. Definitions and sources of variables are provided in the Appendix.

#### 4.3. Results

#### 4.3.1. Main estimations

Table 4.4 reports the results of the main estimations. We test the sensitivity of the results by considering five different specifications for the set of explanatory variables. All specifications include industry fixed effects.

In column (1), we include only the key explanatory variable *Bank female leaders*. We then successively add firm-level controls in column (2), country controls in column (3), *Bank size* and *Bank loans to assets* in column (4), and *Bank equity to assets* in column (5). We add *Bank equity to assets* separately from other bank controls because *Bank size* and *Bank equity to assets* are highly correlated (0.67), which leads us to test the inclusion of this variable.

The key finding is the negative coefficient of *Bank female leaders*. This result is observed in all specifications of the set of explanatory variables, confirming that it does not depend on the chosen explanatory variables.<sup>19</sup> Therefore, our main conclusion is that the proportion of women in bank leadership has a negative impact on firms' bank debt. In other

<sup>&</sup>lt;sup>19</sup> We also ran the regressions by including bank country fixed effects in all specifications. This did not change our main finding that *Bank female leaders* exerts a significant negative effect on *Firm bank debt*. Estimations are available on request.

words, the gender of bank leaders affects firms' access to credit. Thus, our estimations support the hypothesis that a higher proportion of women in bank leadership is detrimental to borrowing firms. Banks with higher proportion of female leaders are more cautious in their lending policies. We interpret this result by the higher risk aversion of women compared to men, in line with the literature showing lower risk-taking for banks with higher presence of women in top management (Palvia, Vähämaa and Vähämaa, 2015; Dong, Girardone and Kuo, 2017; Palvia, Vähämaa and Vähämaa, 2020).

Since a higher proportion of women in bank leadership can hinder firms' access to credit, policies promoting female leaders in banks can lead to a reduction in the amount of credit for firms on the long term. This potentially inefficient allocation of credit can affect the competitiveness and efficiency of firms. Moreover, because women are more risk averse, bank female leaders may lend less to firms with higher credit risk, which may suffer more from this credit squeeze. Similarly, firms with a risky bank led by a higher proportion of women may face a greater reduction of credit, as women leaders in a risky bank may be less inclined to increase bank risk.

The results are also economically significant. Based on the full specification in column (5), a one-standard deviation increase in *Bank female leaders* (10.786) produces a 0.43 percentage point decrease ( $-0.040 \times 10.786$ ) in firm debt. This decrease amounts to 2.01% of the average of firm bank debt. Thus, the negative effect of the proportion of women among bank directors and managers on firms' bank debt is statistically and economically significant.

The signs and significance of the estimated coefficients on the control variables are as expected. *Firm size* has a significant and positive coefficient in all estimations, consistent with the view that larger firms have easier access to bank loans. *Firm ROA* is significantly negative in all estimations, consistent with the pecking-order theory that firms with higher profitability require less bank debt. *Firm tangibility* is significantly positive in all estimations, reflecting the fact that a higher share of tangible assets in total assets increases the collateral value of firms and thus facilitates their access to bank loans.

The significant and positive coefficients for *GDP per capita* and *Private credit to GDP* can be explained by the fact that firms have an easier access to bank debt in more economically and financially developed countries. The significantly positive coefficient for *Inflation* accords with the fact that firms have incentives to borrow more during periods of high inflation.

Regarding bank controls, we find that *Bank loans to assets* is significantly positive, consistent with the intuition that banks that are more specialized in lending will lend more. *Bank size* is also significantly positive, supporting the view that large banks lend more. Finally

*Bank equity to assets* is significantly positive, in line with the fact that better capitalized banks can lend more.

#### 4.3.2. Robustness checks

#### 4.3.2.1. Instrumental variable approach

Our results may be due to potential endogeneity issues related to reverse causality or omitted variable bias. Although we have included a wide range of control variables with industry fixed effects to address issues of unobserved confounding variables, omitted variables may still affect our estimates. Also, reverse causality issues can affect the robustness of our findings with a negative effect of firm bank debt on the proportion of women among bank directors and managers. Firms that need a lot of credit may apply for a loan at banks that take higher risks in their lending: since women are more risk-averse, these banks may be run by fewer women (Gulamhussen and Santa, 2015; de Cabo, Gimeno and Nieto, 2012).

Therefore, we tackle potential endogeneity issues by running a two-stage least squares (2SLS) IV regression between firm bank debt and the proportion of women among bank directors and managers. As an instrument, we choose *Mean bank female leaders*, which is defined by the mean proportion of women among bank directors and managers in the bank's country, excluding the value of the firm's bank from the calculation. This instrument is relevant to our research question because there can be no relation between mean proportion of bank female leaders in the country and the firm bank debt. Moreover, the proportion of bank female leaders in the country of the firm's bank is expected to be related to the proportion of female leaders in the firm's bank, as banks in the same country have the same regulations on women's work and gender quotas, and an identical culture in terms of gender equality.

Table 4.5 displays the first- and second-stage results of the 2SLS IV regressions. We use the same five specifications as for our main estimates. The Cragg-Donald Wald F-statistic tests are significant, indicating that *Mean bank female leaders* is strongly correlated with the endogenous variable *Bank female leaders*. This supports that *Mean bank female leaders* is a relevant instrument for this study. In addition, this instrument is valid because the mean proportion of women as bank directors and managers in the country, when the bank of the firm is excluded, does not directly affect the female proportion of the bank of the firm. The results of the first stage indicate a positive and significant relationship between *Mean bank female leaders* and *Bank female leaders*, suggesting that banks from countries where more women are bank directors and managers are more likely to have a higher proportion of women among their

directors and managers. This evidence further confirms that our instrument is valid and relevant. Durbin-Wu-Hausman endogeneity tests were conducted to assess the endogeneity of *Bank female leaders*. The results of these tests are significant: it was necessary to address endogeneity issues with an IV approach.

Turning now to the second-stage regressions, we observe significant and negative coefficients of *Bank female leaders* on *Firm bank debt* in all specifications. These results are consistent with our main findings. Banks with a higher proportion of women among directors and managers lend less loans to firms. Thus, the negative relationship between the proportion of bank female leaders and firm loans persists after addressing endogeneity concerns.

#### 4.3.2.2. Sample composition

Next, we construct an alternative sample in terms of countries. Since observations from France and Spain make up the majority of our sample (46.66 % of total observations), we run estimations excluding these countries.

We want to check whether these two countries drive our result on the impact of bank female leadership on firms' bank debt. To assess the sensitivity of our results, we conduct OLS regressions, first excluding observations from France (26.71% of total sample), and then excluding observations from both France and Spain. In each case, we use our two most detailed specifications: the first includes firm and country controls as well as industry fixed effects, and the second also includes bank controls.

Table 4.6 lays out the estimations. *Bank female leaders* has a negative and significant coefficient in all regressions, meaning again that the higher the proportion of bank female leaders, the lower the firm's bank debt. Thus, the results are not driven by France and Spain, as the effect of bank female leaders on firm bank debt remains significantly negative. Regressions excluding observations from the main countries in the sample confirm our finding.

#### 3.2.3.3. Alternative independent variables

We test whether our results still hold with alternative independent variables. So far, we have only used the global proportion of women among all directors and managers, from several departments and hierarchical levels of the bank. However, a bank's lending strategy is implemented by its decision-making bodies (Gambacorta et al., 2022), such as the board of directors, the executive committee, or the executive board. Members of these bodies may exert a more direct influence by implementing the bank's lending strategy, than other leaders

working in other departments or in lower positions. We therefore test whether our main result still holds when we consider only the banks' top leaders.

We can also question whether the gender of other leaders in other departments can also influence lending decisions. In addition, managers at lower hierarchical levels may be closer to the firm and may ultimately decide on the granting of the loan. We therefore aim to verify whether these other types of leaders also influence firm bank debt.

To do so, we create two new independent variables *Bank female top leaders* and *Bank female other leaders*. *Bank female top leaders* is equal to the proportion of women among top leadership positions of the bank, i.e. among members of the board of directors, executive committee or executive board. *Bank female other leaders* measures the proportion of women among other leaders, who are not members the board of directors, executive committee or executive board. Table 4.7 presents the results. As before, we employ the two most comprehensive specifications.

We observe negative and significant coefficients for both *Bank female top leaders* and *Bank female other leaders*, showing that the proportions of bank female top leaders and bank female other leaders affect negatively firm bank debt. These results confirm our main results and indicate that our results are influenced both by the presence of women among top leaders and among other leaders. Thus, the result does not depend on the type of leaders, but on the overall gender diversity of bank leaders. This also validates the choice to use the proportion of women among all bank leaders as our main independent variable *Bank female leaders*.

#### 4.3.2.4. Time period

One might question whether our results are affected by the time period. Since Bankfocus only provides the gender of the current directors and managers, we have conducted our main estimates in 2022. However, we can assume that bank leaders do not change frequently and consider that the proportion of women among directors and managers in 2022 will most likely be close to that in 2021. Therefore, we rerun our estimations testing the effect of *Bank female leaders* in 2022 on *Firm bank debt* in 2021-2022 and in 2021. We use our two most detailed specifications in these two samples, as we did before. We also cluster the standard errors by firm for the sample with observations in 2021-2022 to account for potential serial correlation within firms.

Table 4.6 reports the results. Again, we observe a negative and significant effect of *Bank female leaders* on *Firm bank debt* in all specifications, indicating that female-led banks

lend less credit to firms. Our previous results still hold and do not depend on the time period. Thus, these results corroborate our main findings.

#### 4.4. Additional estimations

#### 4.4.1. Estimations by bank debt maturity

So far, we have found that the proportion of bank female leaders exerts a negative effect on firms' bank debt. However, this effect can differ depending on the maturity of this debt. When considering bank debt as a whole, we do not take into account the differences between short-term and long-term bank debt. It can therefore occur that the impact of female bank leadership on total bank debt hides very different effects on short-term bank debt and longterm bank debt. We thus investigate the effect of female bank leadership by distinguishing both types of bank debt by maturity. We test the hypothesis that the negative effect of the proportion of bank female leaders is stronger for long-term bank debt than for short-term bank debt. This hypothesis is based on the fact that long-term bank loans are riskier than short-term bank loans. By definition, they have longer commitment periods and, as such, their return is more uncertain given long-term economic fluctuations. In addition, they are generally associated with higher loan rates, which increases the risk of default.

Therefore, the fact that long-term loans carry higher risks than short-term loans should lead to a stronger negative effect of the proportion of bank female leaders on long-term bank debt than on short-term bank debt at the firm level, given the higher risk aversion of women.

We test this hypothesis by rerunning our regressions with the following two dependent variables: *Firm ST bank debt*, defined as short-term bank debt divided by total assets, and *Firm LT debt*, defined as long-term bank debt divided by total assets, We consider two specifications of the set of controls: with all controls, with all controls except bank controls.

Table 4.9 reports the results. We observe that *Bank female leaders* is significantly negative when explaining *Firm LT bank debt*, but significantly positive when explaining *Firm ST debt*. These results hold for both specifications.

Results are also economically significant. Based on the full specification, we find that a one-standard deviation increase in *Bank female leaders* produces an increase of 0.30 percentage point of *Firm ST bank debt* from the mean of 6.21%, a 4.86% increase. Similarly, we find that a one-standard deviation increase in *Bank female leaders* produces a decrease of 0.95 percentage point of *Firm LT bank debt* from the mean of 13.88%, a 6.84% decrease. We therefore observe that the effects of female bank leadership are economically stronger for shortterm bank debt and for long-term bank debt than they are for total firm bank debt.

The results confirm our hypothesis that the proportion of bank female leaders has a more detrimental effect on long-term bank debt than on short-term bank debt at the firm level. This is consistent with the observation that women are more risk-averse than men and that long-term loans carry more risks than short-term loans.

However, they also suggest that the proportion of bank female leaders has a positive rather a negative effect on short-term bank debt. In other words, a greater presence of women in bank leadership favors the access of firms to short-term bank loans.

One possible explanation for this positive effect is the fact that female bank leaders compensate for their higher reluctance to grant long-term loans by a more relaxed lending policy for short-term loans. This can be related to the fact that women exhibit more prosocial behavior, with greater empathy (Kamas and Preston, 2021) and altruism (Cox and Deck, 2007) than men.

Short-term loans and long-term loans do not meet the same financing needs for firms. Long-term loans are of major importance for firms to implement investments. However, even if the lack of long-term loans can prevent the firm from taking advantage of all investment opportunities, greater access to short-term loans can help preserve the firm's financial situation by reducing liquidity constraints.

These contrasting results for short-term bank debt and long-term bank debt confirm the importance of considering both types of bank debt separately. They provide a complex view of the effect of the proportion of bank female leaders on firm bank debt, which is not observed when considering bank debt as a whole at the firm level.

#### 4.4.2. Firm characteristics

Our main estimations show that the proportion of women among bank leaders exerts a negative influence on firms' bank debt. However, we conducted our analysis for all types of firms without considering whether this effect differs across firms. Therefore, we can question whether this effect is influenced by firm-level heterogeneity.

First, we examine whether firm size affects the effect of the proportion of bank female leaders. We test the hypothesis that the negative effect of bank female leaders on firms' bank debt is smaller when firms are larger. This hypothesis is based on the fact that larger firms are considered to be less risky. Larger firm size is associated with less information asymmetries, and greater diversification in terms of products and geographic markets. As a result, firm size is generally associated with lower default risk in the literature (e.g., Zhang et al., 2020). Therefore, the negative impact of bank female leaders on firms' bank debt should decrease with firm size, as large firms should be less affected by the risk aversion of bank female leaders. Moreover, women may lend more efficiently and responsibly than men, since banks led by women are more performant (Reinert, Weigert and Winnefeld, 2016; Dong, Girardone and Kuo, 2017; Farag and Mallin, 2017; Baselga-Pascual and Vähämaa, 2021). Female-led banks may therefore lend less to smaller firms, since such firms have generally higher credit risk.

We test this hypothesis by adding the interaction term *Firm size* × *Bank female leaders* in the regression with all controls. The results are reported in Table 4.10 in column (1). We find that *Firm size* × *Bank female leaders* is significantly positive.

Therefore, we find support for the hypothesis that larger firms are less negatively affected by female bank leadership. Can the effect of firm size rise high enough to turn the negative effect of *Bank female leaders* into a positive one? To answer this question, we compute the value of firm size above which the negative effect of *Bank female leaders* becomes a positive one. The total effect of *Bank female leaders* on bank debt is the sum of the coefficient for *Bank female leaders* and the coefficient for the interaction term *Firm size* × *Bank female leaders* nultiplied by the value of *Firm size*. The computation of the threshold for *Firm size* leads to a value of 8.65. This value is above the mean of *Firm size* for the sample (7.641) and is lower than the maximal value (11.291). We can thus conclude that the sign of the overall effect of *Bank female leaders* on bank debt is conditional to the level of firm size. Female bank leadership decreases firms' bank debt when firm size is low, but exerts a positive impact when firm size is high. In other words, female bank leadership can be beneficial for firms.

Second, we test whether firm performance influences the relationship between the proportion of women among bank directors and managers and bank debt. We expect that the negative effect of bank female leaders on firms' bank credit would be lower when firm performance is higher. Higher performance is a positive indicator of financial health and a signal of good management. It is therefore negatively related to the financial risk of the firm. By reducing the risk, it thus moderates the negative effect of the proportion of bank female leaders.

We test this hypothesis by adding the interaction term *Firm ROA* × *Bank female leaders* in the regression with all controls. The results are reported in Table 4.10 in column (2). We find evidence that firm performance does not affect the effect of the presence of women in bank leaders on firms' bank debt: the coefficient of *Firm ROA* × *Bank female leaders* is not

significant. This does not confirm the hypothesis that higher firm performance moderates the harmful impact of the presence of women in bank leaders on firms' bank debt.

Third, we examine whether the effect of female bank leadership on firms' bank debt is influenced by the gender of the firm CEO. A natural question that arises when considering the consequences of female bank leadership is whether female-led firms may benefit from it. A large number of studies has shown that female-led firms have lower access to credit than male-led firms in both developed and emerging countries (Asiedu et al., 2013; de Andrés, Gimeno and de Cabo, 2021). Therefore, one motivation to foster the presence of women in bank leadership through mandatory regulation is the fact that it can reduce the gender gap in access to credit. It is thus of great importance to know whether higher female bank leadership contributes to the provision of more loans to women than to men.

We test the hypothesis that female-led banks are more likely to lend to firms headed by a female CEO. It is mainly based on the theories of homophily sharing the idea that similar people are more likely to build new ties (Ertug et al., 2018; Kossinets and Watts, 2009). Previous studies have found that homophily encompasses various dimensions such as gender (e.g. Zhou et al., 2024), ethnicity (e.g. Freeman and Huang, 2015), age (e.g., Reagans, 2011), nationality (e.g., Gibson and Zeller-Bruhn, 2001) and can drive a wide range of social interactions, like in scientific collaborations (e.g., Zhou et al, 2024), police behaviors (e.g., Donohue and Levitt, 2001), judicial sentencing (e.g., Abrams, Bertrand and Mullainathan, 2012) or sports (e.g., Price and Wolfers, 2010). Beck, Behr and Madestam (2018) have also provided evidence of gender-based homophily in the supply of credit. Women among bank leadership can have greater empathy for female-led firms due to shared experiences or perceptions with their managers. Moreover, the fact that women exhibit a more prosocial behavior (Kamas and Preston, 2021) can lead women in top bank management to implement lending policies that aim to reduce gaps in access to credit such as the gender gap, in order to increase women's economic opportunities and promote gender equality in entrepreneurship.

To investigate this hypothesis, we construct the variable *Firm female* CEO, defined as a dummy variable equal to one if the firm CEO is a woman and zero otherwise. We then rerun the regression by adding *Firm female CEO* and the interaction term *Firm female CEO* × *Bank female leaders* to the set of controls. The results are displayed in Table 4.10 in column (3).

We show that the gender of the firm CEO affects the relation between the presence of women in bank leaders and firm's bank debt with the significantly positive coefficient of *Firm female CEO* × *Bank female leaders*. It is consistent with our hypothesis that the adverse effect

of the presence of women in banks leaders on firms' bank debt is lower for firms managed by women.

We can question whether the effect of female bank leadership remains negative for female-led firms. To this end, we perform a joint hypothesis test to determine whether the sum of the coefficients *Bank female leaders* and *Firm female CEO*  $\times$  *Bank female leaders* is significant. We obtain a chi-2 statistic equal to 0.25, which is not statistically significant, showing that the overall effect of *Bank female leaders* is not significant in this regression.

Thus, we conclude that higher female bank leadership has a negative effect on male-led firms but no effect on female-led firms.

#### 4.5. Conclusion

Our paper studies the impact of female bank leadership on firms' bank debt. Through an empirical analysis matching bank- and firm-level data across eleven European countries, we show that higher female bank leadership leads to a statistically and economically significant decrease in firms' bank debt. Specifically, we find that a one-standard deviation increase in female bank leadership reduces firms' bank debt by 2.01% on average. We explain this finding by the higher risk aversion typically displayed by women compared to men, making banks with greater female leadership more reluctant to extend debt financing.

Further analysis reveals nuanced impacts across debt maturity profiles. Female bank leadership is associated with reduced access to long-term bank debt but has a positive relation with short-term bank debt. This indicates female-led banks are more cautious regarding longterm exposure but remain willing to provide short-term financing.

Additionally, we show that female bank leadership only reduces bank debt for firms with male CEOs while it does not influence bank debt for firms with female CEOs. This finding aligns with the evidence of own-gender preferences on the supply of credit. Interestingly, we observe that greater firm size mitigates the negative effect of female bank leadership on firms' bank debt such that the effect can become positive for larger firms. Finally, we do not conclude to any influence of firm performance on the effect of female bank leadership on firms' bank debt.

A potential limitation of our paper relates to the sample construction. By restricting the analysis to firms with only one lending bank, we capture predominantly small firms that do not have multiple lending relationships. As smaller firms are generally exposed to higher credit risk, the negative association between bank female leadership and firm bank debt may not reflect a higher risk aversion of female-led banks, but rather a more effective lending approach in assessing the credit risk of borrowers. Therefore, the lower firm debt amount for female-led banks may be evidence of more responsible lending by women, rather than risk aversion. Future research could help to disentangle these interpretations, for example by examining whether the results differ when larger firms or those with multiple lending relationships are included.

Our results have meaningful implications for firms seeking to access bank credit, as well as banks aiming to optimize their lending policies. The findings suggest that gender composition in bank leadership is an important factor influencing credit availability. Firms may benefit by considering bank leadership demographics when selecting financial partners. Meanwhile, banks can evaluate if their risk controls appropriately reflect the gender balance of their leadership teams. In addition, increasing the number of female CEOs in a country also plays a critical role in credit allocation. Policies promoting female leadership in both lending banks and borrowing firms affect lending outcomes by reducing the gender gap in access to credit for women-led firms. The implementation of such policies can increase the growth of women-led firms, thereby promoting women's financial empowerment.

Overall, this study enriches our understanding of how gender characteristics on both the lending and borrowing sides affect debt financing outcomes. The results expand existing knowledge on gender dynamics in corporate finance and provide actionable guidance to market participants. Further research can build on these conclusions by exploring the additional effects of gender dynamics within banks.

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### Tables

# Table 4.1.Descriptive statistics

This table reports the descriptive statistics for the variables employed in this study. Definitions of all variables are provided in the Appendix.

Variable	Level	Observations	Mean	Standard deviation	Minimum	Maximum
Dependent variables						
Firm bank debt	Firm	116,782	21.475	24.243	0	81.687
Firm ST bank debt	Firm	116,782	6.214	10.559	0	38.351
Firm LT bank debt	Firm	116,782	13.884	18.844	0	64.339
Independent variables						
Bank female leaders	Bank	116,782	32.016	10.786	0	76.923
Firm size	Firm	116,782	7.641	1.919	4.412	11.291
Firm ROA	Firm	116,782	4.735	9.654	-16.209	26.090
Firm tangibility	Firm	113,734	25.196	28.066	0	90.516
GDP per capita	Country	116,782	10.742	0.244	10.364	11.676
Inflation	Country	116,782	7.285	1.323	5.222	10.001
Private credit to GDP	Country	116,782	110.379	28.691	28.012	158.750
Bank size	Bank	107,222	18.206	1.894	14.445	21.008
Bank loans to assets	Bank	106,795	51.289	19.128	11.819	78.492
Bank equity to assets	Bank	107,221	7.576	3.695	2.714	16.384
Bank female top leaders	Bank	116,644	32.410	12.229	0	100
Bank female other leaders	Bank	116,272	29,828	13.434	0	100
Firm female CEO	Firm	33,849	0.122	0.327	0	1
Mean bank female leaders	Country	116,782	32.016	7.619	20.786	43.244

# Table 4.2.Bank female leaders by country

Country	Observations	Mean	Standard deviation	Minimum	Maximum
Austria	2,601	26.733	8.762	0	69.014
Denmark	14,610	25.494	6.905	0	50.000
France	31,189	38.187	10.620	0	56.250
Germany	3,922	23.152	15.675	0	76.923
Greece	4,031	24.683	3.359	0	39.429
Ireland	4,250	40.085	9.098	15.663	50.000
Luxembourg	302	32.223	9.072	11.538	47.368
Netherlands	99	37.568	5.066	28.916	42.675
Portugal	17,118	26.683	8.295	10.526	58.333
Spain	23,296	26.442	5.063	0	50.000
United Kingdom	15,364	42.896	4.363	0	60.000
Total	116,782	32.016	10.786	0	76.923

This table reports the descriptive statistics for the main explanatory variable Bank female leaders by country.

# Table 4.3.Correlation matrix

This table presents the pairwise correlations of the variables employed in the study.

	Firm bank debt	Firm ST bank debt	Firm LT bank debt	Bank female leaders	Firm size	Firm ROA	Firm tangibility	GDP per capita	Inflation	Private credit to GDP	Bank size	Bank loans to assets	Bank equity to assets
Firm bank debt	1												
Firm ST bank debt	0.554	1											
Firm LT bank debt	0.811	0.020	1										
Bank female leaders	-0.045	0.072	-0.113	1									
Firm size	0.007	0.138	-0.080	0.240	1								
Firm ROA	-0.234	-0.100	-0.200	0.018	0.070	1							
Firm tangibility	0.316	0.080	0.342	-0.092	-0.001	-0.131	1						
GDP per capita	0.102	0.207	-0.016	0.180	0.228	0.060	0.145	1					
Inflation	0.154	0.056	0.147	-0.227	-0.157	-0.025	0.189	-0.158	1				
Private credit to GDP	0.102	0.238	-0.024	0.104	0.048	0.083	0.038	0.094	-0.221	1			
Bank size	-0.066	-0.037	-0.064	0.285	0.209	-0.029	-0.145	-0.154	-0.006	-0.150	1		
Bank loans to assets	-0.023	-0.121	0.063	-0.091	-0.119	-0.032	-0.064	-0.219	-0.142	-0.045	-0.209	1	
Bank equity to assets	0.136	0.094	0.109	-0.275	-0.235	0.016	0.230	0.150	0.377	0.113	-0.673	-0.140	1

### Table 4.3.Main estimations

This table presents the results of OLS regressions. The dependent variable is *Firm bank debt*. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Bank female leaders	-0.141***	-0.097***	-0.052***	-0.041***	-0.040***
	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)
Firm size		0.237***	0.179***	0.224***	0.239***
		(0.038)	(0.038)	(0.041)	(0.041)
Firm ROA		-0.476***	-0.525***	-0.541***	-0.541***
		(0.007)	(0.007)	(0.007)	(0.007)
Firm tangibility		0.224***	0.187***	0.190***	0.189***
		(0.003)	(0.003)	(0.003)	(0.003)
GDP per capita			9.820***	10.536***	10.445***
			(0.294)	(0.326)	(0.327)
Inflation			2.759***	2.805***	2.708***
			(0.055)	(0.060)	(0.068)
Private credit to GDP			0.104***	0.109***	0.108***
			(0.002)	(0.003)	(0.003)
Bank size				0.175***	0.302***
				(0.042)	(0.059)
Bank loans to assets				0.049***	0.054***
				(0.004)	(0.004)
Bank equity to assets					0.098***
					(0.032)
Industry FE	Yes	Yes	Yes	Yes	Yes
Observations	116,782	113,734	113,734	103,900	103,899
Adjusted R-squared	0.058	0.158	0.190	0.190	0.190

#### Table 5.4. Instrumental variable approach

This table presents the results of the 2SLS instrumental variable models. The upper part of the table displays the results of the second-stage regression. *Bank female leaders* is instrumented by *Mean bank female leaders*. The dependent variable is *Firm bank debt*. Standard errors are given in parentheses. The lower part of the table shows the results of the first-stage regression with the dependent variable *Bank female leaders*, as well as the instrument validity test and the endogeneity test. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bank female leaders	-0.258***	-0.176***	-0.082***	-0.065***	-0.061***
	(0.009)	(0.010)	(0.011)	(0.012)	(0.012)
Firm size		0.346***	0.208***	0.238***	0.251***
		(0.039)	(0.038)	(0.041)	(0.041)
Firm ROA		-0.477***	-0.525***	-0.541***	-0.541***
		(0.007)	(0.007)	(0.007)	(0.007)
Firm tangibility		0.220***	0.186***	0.189***	0.189***
		(0.003)	(0.003)	(0.003)	(0.003)
GDP per capita			9.935***	10.693***	10.583***
			(0.295)	(0.332)	(0.333)
Inflation			2.689***	2.777***	2.686***
			(0.058)	(0.061)	(0.069)
Private credit to GDP			0.104***	0.110***	0.109***
			(0.002)	(0.003)	(0.003)
Bank size				0.212***	0.331***
				(0.044)	(0.060)
Bank loans to assets				0.049***	0.054***
				(0.004)	(0.004)
Bank equity to assets					0.095***
					(0.032)
Industry FE	Yes	Yes	Yes	Yes	Yes
Observations	116,782	113,734	113,734	103,900	103,899
Adjusted R-squared	0.056	0.157	0.190	0.190	0.190
First-stage					
Mean bank female leaders	0.998***	0.995***	1.001***	1.061***	1.067***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Instrument test Cragg-Donald Wald F- statistic	108,813 ***	91,676.2***	70,607.4***	63,380.2***	63,558.8***
Endogeneity test Durbin Wu-Hausman test statistic	299.319***	122.599***	12.831***	6.269**	4.731**

### Table 4.6.Excluding France and Spain

This table presents the results of OLS regressions. The dependent variable is *Firm bank debt*. The two first regressions are performed on a sample excluding observations from France. The two last regressions are performed on a sample excluding observations from France and Spain. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	Without France		Without Fran	nce and Spain
Bank female leaders	-0.060***	-0.073***	-0.053***	-0.046***
	(0.009)	(0.010)	(0.010)	(0.011)
Firm controls	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
Bank controls	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	82,545	80,214	59,420	57,601
Adjusted R-squared	0.169	0.171	0.206	0.209

## Table 4.7. Alternative independent variables

This table presents the results of OLS regressions. The dependent variable is *Firm bank debt*. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)	(4)
Bank female top leaders	-0.039***	-0.032***		
	(0.006)	(0.007)		
Bank female other leaders			-0.052***	-0.045***
			(0.005)	(0.005)
Firm controls	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
Bank controls	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	113,601	103,767	113,251	103,436
Adjusted R-squared	0.190	0.190	0.190	0.190

### Table 4.8.Alternative time period

This table presents the results of OLS regressions. The dependent variable is *Firm bank debt*. The two first regressions are performed during the period 2021-2022. The two last regressions are performed in 2021. Standard errors are reported in parentheses and clustered by firm. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	2021-	-2022	202	21
Bank female leaders	-0.127***	-0.063***	-0.093***	-0.018**
	(0.006)	(0.007)	(0.007)	(0.008)
Firm controls	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
Bank controls	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	222,386	202,590	108,652	98,691
Adjusted R-squared	0.171	0.176	0.175	0.180

#### Table 4.9. Bank debt maturity

This table presents the results of OLS regressions. The dependent variable is *Firm ST bank debt* in the two first regressions and *Firm LT bank debt* in the two last ones. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	Firm ST	bank debt	Firm LT bank debt		
Bank female leaders	0.023***	0.028***	-0.093***	-0.088***	
	(0.003)	(0.003)	(0.005)	(0.006)	
Firm controls	Yes	Yes	Yes	Yes	
Country controls	Yes	Yes	Yes	Yes	
Bank controls	No	Yes	No	Yes	
Industry FE	Yes	Yes	Yes	Yes	
Observations	113,734	103,899	113,734	103,899	
Adjusted R-squared	0.150	0.156	0.173	0.177	

#### Table 4.10. Firm characteristics

This table presents the results of OLS regressions. The dependent variable is *Firm bank debt*. Standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)
Firm size × Bank female leaders	0.055***		
	(0.004)		
Firm ROA × Bank female leaders		-1.396e-04	
		(6.926e-04)	
Firm female CEO × Bank female leaders			0.077**
			(0.038)
Bank female leaders	-0.476***	-0.040***	-0.094***
	(0.030)	(0.008)	(0.015)
Firm size	-1.509***	0.239***	0.441***
	(0.125)	(0.041)	(0.083)
Firm ROA	-0.539***	-0.537***	-0.558***
	(0.007)	(0.023)	(0.013)
Firm female CEO			-3.089***
			(1.120)
Firm controls	Yes	Yes	Yes
Country controls	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	103,899	103,899	31,140
Adjusted R-squared	0.192	0.190	0.322

### Appendix

Variable	Definition	Source
Dependent variables		
Firm bank debt	Firm long-term and short-term borrowings to total assets (%).	Amadeus and own calculations
Firm ST bank debt	Firm short-term borrowings to total assets (%).	Amadeus and own calculations
Firm LT bank debt	Firm long-term borrowings to total assets (%).	Amadeus and own calculations
Independent variables		
Bank female leaders	Proportion of females among directors and managers of the bank (%).	Bankfocus and own calculations
Firm size	Natural logarithm of firm total assets.	Amadeus
Firm ROA	Firm profit divided by total assets (%).	Amadeus
Firm tangibility	Firm tangible assets divided by total assets (%).	Amadeus
GDP per capita	Natural logarithm of GDP per capita of the country. GDP per capita is measured at purchasing power parity in constant 2017 international \$.	World Development Indicators
Inflation	Consumer price index of the country (%).	World Development Indicators
Private credit to GDP	Financial resources provided to the private sector as by domestic money banks as a share of GDP of the country (%). Data for the year 2022 being missing, we replace them with values of 2021.	Global Financial Development Database
Bank size	Natural logarithm of bank total assets.	Bankfocus
Bank loans to assets	Bank gross loans and advances to customers divided by total assets (%).	Bankfocus
Bank equity to assets	Bank total equity divided by total assets (%).	Bankfocus
Bank female top leaders	Proportion of females among bank top leadership positions, i.e. among members of board of directors, executive committee and executive board (%).	Bankfocus and own calculations
Bank female other leaders	Proportion of females among other managerial positions than top leadership positions (%).	Bankfocus and own calculations

### Definitions and sources of variables
Firm female CEO	Dummy equal to 1 when the firm CEO is a Amadeus female.
Mean bank female leaders	Mean of the proportion of females among Bankfocus and own directors and managers of banks of the country calculations (%). The mean is calculated without the value of the proportion of females among directors and managers of the observation.

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## Chapter 5<sup>20</sup>

## Young Leaders, Sustainable Lenders? How Bank Leaders' Age Influences Sustainable Lending<sup>+</sup>

#### Abstract

This research examines the effect of the age of bank board directors and top executives on sustainable lending. Using a sample combining loan-, firm-, and bank-level data from the syndicated loan market, we find that sustainable loans are significantly less likely to be granted by a bank with older bank board directors and top executives, in line with the view that young individuals are more concerned about sustainability. This result is robust to controlling for endogeneity, using alternative models, variables, or sample. Additional estimations show that this effect is generational: a sustainable loan is more likely to be granted by a bank with a higher presence of millennials, while the opposite is true for the silent generation. In particular, the presence of the youngest bank leaders, rather than the oldest ones, influence sustainable lending. Overall, the findings suggest that younger leaders can promote sustainability.

**JEL Codes**: D22 • G21 • G41 • Q01

Keywords: age • sustainable lending • banking

<sup>&</sup>lt;sup>20</sup> This chapter is a sole-authored paper.

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## 5.1. Introduction

Over the past decade, the global commitment to sustainable economic development has intensified. The recent United Nations Sustainable Development Goals Report 2024<sup>21</sup> (United Nations, 2024) underscores the persistent challenges the world still faces and reaffirms the urgent need to achieve the 17 Sustainable Development Goals (SDGs) outlined in the 2030 Agenda for Sustainable Development (United Nations, 2015). These goals aim to address critical issues such as poverty, inequality, and climate change. Other regulations, like the European Commission's Action Plan on Sustainable Finance have further strengthened this global initiative by promoting sustainable investment, integrating sustainability into risk management, and fostering transparency and long-term perspectives in economic activity (European Commission, 2020a).

As major providers of financing to the real economy, banks can play a crucial role in this movement by integrating environmental, social, and governance (ESG) criteria into financial decision-making and promoting sustainable projects (European Commission, 2020b). Green, social and sustainability-linked loans, have therefore become significant components of the financial market. In 2021, sustainable syndicated loans reached USD 716.6 billion, more than tripling compared to the previous year<sup>22</sup>.

To facilitate the global use of green and sustainable loans, the Loan Market Association (LMA), the Asia Pacific Loan Market Association (APLMA) and the Loan Syndications and Trading Association (LSTA), have established a framework to define these instruments. These guidelines were released in the Green Loan Principles (GLP) in 2018, the Sustainability Linked Loan Principles (SLLP) in 2019 and the Social Loan Principles (SLP) in 2021<sup>23</sup>. Green and social loans refer to loans made exclusively to finance green or social projects. Sustainability-linked loans are financial instruments whose terms and conditions can be modified depending on the borrower's achievement of certain ESG objectives. As a result, these loans are accessible not only to companies operating in green sectors, but also to a wider range of companies. The

<sup>&</sup>lt;sup>21</sup> The UN SDGs Report 2024 can be found here:

https://unstats.un.org/sdgs/report/2024/The-Sustainable-Development-Goals-Report-2024.pdf<sup>22</sup> Sustainable Finance Review, 2021. Source: Refinitiv Eikon.

https://www.lseg.com/en/data-analytics/products/deals-intelligence

<sup>&</sup>lt;sup>23</sup> The guidelines defining green, social and sustainability-linked loans can be found here: <u>https://www.lsta.org/content/?\_industry\_sector=guidelines-memos-primary-market</u>

term "sustainable loans" refers therefore to all types of such loans, including green, social and sustainability-linked loans.

Given the significant rise of sustainable loans and their key role in achieving sustainability goals, it is crucial to understand which factors drive sustainable lending. Commitment to sustainability reflects personal values related to environmental concerns, social responsibility and ethical governance, which are influenced by individual factors, such as age. Since a bank's sustainable strategy is influenced by the decisions made by its board of directors (Gambacorta et al., 2022), can the age of bank leaders influence sustainable lending? The aim of this paper is therefore to investigate whether the age of bank leaders affects sustainable lending.

Studying the impact of bank leaders age on sustainable lending is of major interest. The literature widely acknowledges that individuals' age can influence their values and practices related to sustainability. Indeed, several studies have demonstrated that age plays a crucial role in shaping individuals' concerns and attitudes towards sustainability (e.g., Wiernik, Ones, and Dilchert, 2013; Gifford and Nilsson, 2014; Lewis, Palm, and Feng, 2019; Mohai and Twight, 1987), as well as influencing their sustainable behaviors (e.g., Wiernik, Ones, and Dilchert, 2013; Gifford and Nilsson, 2014; Wiernik, Dilchert, and Ones, 2016). Given this evidence, it is plausible that in the banking sector, the age of bank leaders may similarly influence their sustainable lending practices.

Despite the growth in sustainable lending, research on its determinants remains limited. Only Gambacorta et al. (2022) have examined how bank leaders' socio-demographic characteristics influence green lending, finding that gender-diverse boards lend less to polluting firms. Our study expands this research in three ways. First, we investigate the effect of bank leaders' age on lending practices, contributing new insights beyond gender diversity. Second, we consider sustainable lending in its entirety, including environmental, social, and governance dimensions, to provide a broader perspective. Third, we measure the sustainability of loans directly at the loan level by analyzing the loan purpose and firms' commitments to sustainable covenants, allowing for more precise identification than using firm characteristics. Therefore, despite the growing interest in green lending, our paper is the first to examine how the age of bank leaders affects sustainable lending.

However, the effect of the age of bank leaders on sustainable lending is far from obvious. The existing literature presents mixed findings on the effect of age on sustainable values and practices. On the one hand, young bank leaders may be more inclined to engage in

## Chapter 5 – Young Leaders, Sustainable Lenders? How Bank Leaders' Age Influences Sustainable Lending

sustainable lending. One argument is that younger managers are more likely to have a greater awareness of sustainability. While common stereotypes reflected in the media show older people as less environmentally conscious than younger people (Irvine, 2012; Twenge, Campbell and Freeman, 2012), many studies also confirm these stereotypes by providing evidence that young people are more environmentally concerned and more willing to act to protect the environment (e.g. Gifford and Nilsson, 2014; Lewis, Palm and Feng, 2019). Another argument for this rationale lies in the personality traits of young people. They tend to be more social and open-minded (Roberts, Walton and Viechtbauer, 2006), less resistant to change (Henry, 2000), more willing to use new technologies (Czaja et al., 2006), adapt (Yeatts, Folts and Knapp, 2000) and adopt new habits (Dennis and Thomas, 2007), which are attitudes positively associated with environmental concern (Rothermich et al., 2021). In comparison, older individuals have more conservative values that focus on business and economic growth (McCright and Dunlap, 2010) rather than sustainability. These findings suggest that younger bank leaders may be more willing to make sustainable loans, while older managers may be more reluctant.

On the other hand, old bank leaders may adopt more sustainable practices than young ones, leading them to lend more sustainably. Some work suggests that older individuals have preferences for ethics (Ruegger and King, 1992), frugality (Morris and Venkatesh, 2000) and responsibility (Smola and Sutton, 2002), which are important determinants of sustainable behavior such as reducing waste. While most studies have shown that environmental concern is higher among young people, older people still engage in more pro-environmental behaviors than young people (e.g. Gifford and Nilsson, 2014, Wiernik, Dilchert and Ones, 2016). Age may also be a proxy for experience, as younger people make more financial mistakes than older people (Agarwal et al., 2009) and may reflect a risk-taking attitude towards investments that declines with age (Bucciol and Miniaci, 2011). Older executives may therefore invest in more strategic investments with lower climate-related transition risks for the bank. In a changing regulatory environment that promotes sustainability, policies may quickly affect the value of financial assets and liabilities of browner firms. The average age of bank leaders may therefore be positively associated with sustainable lending.

Finally, the effect of the age of bank leaders on sustainable lending may be absorbed by other external factors, making the effect of age on lending practices insignificant. Driscoll's (2019) comparison over three decades shows that, while sustainable concern used to be driven by socio-demographic factors such as age, the influence of these predictors has declined over

time. Today, political orientation variables have become stronger determinants of environmental concern. Gray et al. (2019) found that neither age nor cohort generation is associated with environmental concern. Therefore, the age of bank directors may not have a significant impact on sustainable lending.

To test which of these views dominates, we conduct an empirical analysis on a large cross-country sample of syndicated loans from Refinitiv Eikon. We explain the sustainability characteristic of loans with the mean age of bank board directors and top executives and with a wide set of controls, including loan-, firm- and bank-level variables. The main issue in investigating this question is to link loan tranches with bank-level data on the age of bank leaders. Since a syndicated loan tranche is granted by several lending banks, we create a sample of loan-bank pairs by duplicating loan tranches with the number of lending banks so that each observation has one bank. Furthermore, information on the age of bank leaders is only available in Bankfocus. Therefore, we match the loan data with Bankfocus' bank-level data using the names of the lending banks provided by Refinitiv Eikon. The final sample includes 16,065 loan-bank pairs with 6,578 loans issued in 2022-2023 and 274 lending banks from 30 countries around the world.

To preview the results, we find that the mean age of bank directors and top executives is negatively associated with the likelihood that the loan is sustainable. This effect is also economically significant, as a one-standard deviation increase in the mean age of bank top leaders reduces the probability of a sustainable loan by 1.765 percentage points. These findings remain consistent across different robustness tests, when addressing endogeneity issues, using alternative variables, econometric models or changing the sample composition. This result is consistent with the view that older bank top leaders lend less sustainably because they have lower sustainable values.

We further investigate whether the negative effect of bank board directors and top executives on sustainable lending is a generational effect and whether it depends on age composition. Sustainability concerns at the individual level are often shared by people within the same generation. We find that having more millennials among bank top leaders increases the likelihood that the loan is sustainable. Conversely, having more board members and top executives from the silent generation significantly decreases the likelihood of a sustainable loan. No significant effect has been found for generation X. These results suggest that this effect is generational. Moreover, it seems that the younger the youngest executive, the higher the probability that the loan is sustainable, while the effect is insignificant for the oldest. These results indicate that it is mainly the presence of the youngest managers that can positively influence sustainable lending.

This research contributes to three strands of the literature. First, it adds to the body of knowledge on sustainable lending. In this growing literature, most studies limit their investigation to the determinants of green lending only (e.g., Gambacorta et al., 2022; Reghezza et al., 2022). Nevertheless, very few papers have examined sustainable lending as a whole. While the studies by Pinto, Alves and Gonçalo (2024), Kim et al. (2022) and Pohl, Schüler and Schiereck (2023) focus on their spreads, Dursun-de Neef, Ongena and Tsonkova (2023) examine the impact of sustainable lending on borrowers' ESG performance. Thus, this research aims to fill the large research gap on sustainable lending by investigating the effect of the age of bank managers on sustainable lending in the syndicated loan market.

Second, we contribute to the literature on the effect of bank leaders' age on bank behavior. However, scholars have mainly focused on age diversity, providing evidence that the age of young bank leaders increases bank risk-taking (Berger, Kick and Schaeck, 2014) and that age diversity increases the probability of CEO dismissal after regulatory sanctions (Casu et al., 2023) while decreasing bank profitability (Talavera, Yin and Zhang, 2018). This analysis adds to this body of research by exploring how the age of bank leaders affects sustainable lending, in particular.

Finally, we deepen the literature on the effect of age on sustainable behaviors. The review by Gifford and Nilsson (2014) shows that older individuals are more likely to engage in green behaviors. In particular, in the workplace, older individuals are slightly more likely to engage in pro-environmental behaviors (Wiernik, Dilchert and Ones, 2016). This research aims to provide evidence of the influence of the age of bank leaders on the bank's sustainable lending practices.

The paper is organized as follows. Section 5.2 introduces the data and the methodology employed for the empirical analysis. Section 5.3 presents the main findings of the paper. Section 5.4 provides the robustness tests associated to the main results. Section 5.5 exhibits additional estimations. Section 5.6 concludes.

### 5.2. Data and methodology

#### 5.2.1. Data

### 5.2.1.1. Sample

To estimate the effect of bank leaders age on sustainable lending, we combine loan- and bank-level data. Loan-level data are extracted from the Refinitiv Eikon database, which collects information on the global syndicated loan market. As Refinitiv Eikon provides loans at the tranche level, a "loan" in this study refers to a loan tranche that is part of a syndicated loan package. Since sustainable loans are mostly issued in countries with stakeholder-driven economies and well-developed credit markets (Kim et al., 2022), we select loans issued in European and North American countries.

The challenge of this research is then to identify each loan to one bank-level observation. Refinitiv Eikon classifies lenders under numerous categories (e.g., "Bookrunner", "Corporate Lender", "Mandated Arranger Or Co-Manager" "Lead and Co-Lead Managers"...). Since the purpose of this research is to examine the effect of a bank characteristic on the sustainability characteristic of a loan, we follow the rule of Hasan, Minnick and Raman (2020) and Bharath et al. (2011) and choose to keep all lenders that are not classified as simple "Participants". In other words, we retain all lenders that fall into Refinitiv Eikon's "Tier 1" and "Tier 2" agent categories, corresponding to lead and co-lead lenders. When loans are made by multiple lenders, we duplicate each loan observation by the number of lenders, so that each observation in the sample is identified with a unique lender and corresponds to a loan-bank pair. As this study focuses on the characteristics of bank leaders, we keep only commercial banks and drop all other types of lenders.

To examine the effect of bank leaders age, we combine these loan-level data with banklevel data from Bankfocus. Using the full name of the lending bank provided in Refinitiv Eikon, we manually match the bank-level data for more precise identification. To control for borrower characteristics in the estimates, we also add firm-level data from Refinitiv Eikon. We match the firm-level data using the loan issuer identification number provided by Refinitiv Eikon. Following previous literature, we drop loans issued by firms in the financial services sector (firms classified under NAICS code 52). Finally, in order to have a consistent sample, we drop the few observations that have a lending bank or a borrowing firm in a country where we had less than ten observations in the sample. Table 5.1 shows the distribution of sustainable loans by bank country. The final sample includes 16,065 loan-bank pairs, with 6,578 loans issued in 2022-2023 by 3,692 firms and granted by 274 lending banks from 30 countries around the world.

### 5.2.1.2. Main variables

In order to explore how the age of bank leaders affects sustainable lending, we use the variables provided by Refinitiv Eikon to measure sustainable lending. Refinitiv Eikon provides indicators to identify green, social and sustainable loans based on the above guidelines. Following the work of Pinto, Alves and Gonçalo (2024) on sustainable loans, we consider sustainable loans to be those that fall into one of the categories of green, social or sustainability loans. We also choose to include in the category of sustainable loans the loans granted to companies with a sustainable activity, based on the Refinitiv Eikon classification<sup>24</sup>. We define the main dependent variable, sustainable loan, as a dummy equal to one if the loan is sustainable. Sustainable loans account for 21.40% of the loans in the sample, and the majority of them, 69.80%, are sustainability loans and 22.63% are green loans. The descriptive statistics for these variables are presented in Table 5.2.

To measure bank leaders' age, we consider the mean age of bank top leaders only. Since syndicated loans involve large loan amounts, lending decisions are made at the highest hierarchical level of the bank. Moreover, previous literature that focuses on the effect of bank leader characteristics on bank lending focuses on the characteristics of bank board members (e.g., Gambacorta et al., 2022). As Bankfocus provides personal information on all directors and managers of the bank from all levels and departments, we retain all bank leaders whose job description includes the terms "*Board of directors*", "*Executive committee*" and "*Executive board*". They are defined in this study as "bank top leaders". This allows to take into account both the age of board directors who set the strategic direction with broad policies and objectives, and the age of the top executives, who can influence lending practices by overseeing day-to-day operations and implementing policies.

For the calculation of the mean age, we only keep the current top leaders and calculate the age of the leaders with their year of birth if the age information is missing. We also exclude from the sample the few abnormal ages above 100 years. Bankfocus provides personal

<sup>&</sup>lt;sup>24</sup> Sustainable activities of borrowing firms are classified by Refinitiv Eikon as: "*Renewable Energy Equipment* & Services, Wind Systems & Equipment, Stationary Fuel Cells, Photovoltaic Solar Systems & Equipment, Thermal Solar Systems & Equipment, Biomass Power Energy Equipment, Waste to Energy Systems & Equipment, Hydropower Equipment, Wave Power Energy Equipment, Renewable Energy Services, Geothermal Equipment, Renewable Fuels, Biodiesel, Ethanol Fuels, Pyrolytic & Synthetic Fuels, Biomass & Biogas Fuels, Hydrogen Fuel, Carbon Capture & Storage, Electrical Vehicles, Sustainable & Energy Efficient Home Builders, Organic Farming, Power Charging Stations, Alternative Electric Utilities, Hydroelectric & Tidal Utilities, Solar Electric Utilities, Wind Electric Utilities, Biomass & Waste to Energy Electric Utilities, Geothermal Electric Utilities, Independent Power Producers, Renewable IPPs".

information on bank leaders only for the last wave. Therefore, we match loans issued in 2023 only with banks whose accounts were last updated for the same year, so that the year of the age perfectly identifies the year of loan issuance. We do the same for 2022. Our sample therefore includes loans issued in 2022 and 2023, and is composed of the majority of loans issued in 2023, at 88%. The main explanatory variable, *Bank mean top leaders age*, corresponds to the mean age of the top leaders of the lending bank in the year of loan issuance. On average, *Bank mean top leaders age* is between 43 and 78 years old, with an average of 60.44 years. Descriptive statistics are presented in Table 5.2. A detailed description of all variables used in the study can be found in the Appendix.

#### 5.2.2. Methodology

As the main dependent variable *Sustainable loan* is a dummy variable, we estimate probit regressions based on the following baseline model:

 $P(Sustainable \ loan_i = 1 \ | \ Bank \ mean \ top \ leaders \ age_i, \ Controls_i \ )$  $= \Phi \left(\beta_0 + \beta_1 \ Bank \ mean \ top \ leaders \ age_i + \beta_2 \ Controls_i + \varepsilon_i \right)$ 

where *i* indexes the loan-bank pair. Since the sample can include several times the same loan, we cluster standard errors by loan. To facilitate the interpretation, all probit regression tables directly display the marginal effects. The vector *Controls* comprises loan-, firm-, bank-level control variables and fixed effects. Loan type fixed effects are used to ensure that the variation in sustainable lending does not reflect loan types and is not due to the age of bank leaders. We include firm industry fixed effects based on their two-digit NAICS classification to account for industry-specific trends in sustainable loans. Firms in certain industries may be more likely to make a sustainable loan. Table 5.3 reports the distribution of sustainable loans across firm industries. Similar to Dursun-de Neef, Ongena and Tsonkova (2023) and Kim et al. (2022), most sustainable loans are issued in the manufacturing (20.97% of the total) and utilities (20.16% of the total) industries. We also add bank country and year fixed effects to control for unobserved heterogeneity across bank countries and years that may affect *Sustainable loan*.

To isolate the effect of *Bank mean top leaders age*, we follow previous literature focusing on the effect of bank leaders characteristics on lending to choose the loan, firm and bank control variables (e.g., Gambacorta et al., 2022; Bermpei et al., 2023; Hagendorff, Lim and Nguyen, 2023). Loan-level controls aim to account for intrinsic characteristics that may affect the likelihood that the loan is sustainable. Loan-level controls include *Loan amount*, *Loan maturity* and *Loan covenant*. *Loan amount* allows to control for the size of loan.

Sustainable projects can require larger investments. *Loan maturity* corresponds to the number of months between the loan closing date and the date on which the principal amount of the issue comes due. As sustainable projects may have longer payback periods, loans with longer maturities may be more appropriate. To deal with the high skewness of these two variables, we apply the natural logarithm function, as done in the literature. *Loan covenant* is a dummy variable equal to one, when the loan contract contains conditions that the borrower agrees to maintain during the life of the loan, and zero otherwise. Projects funded by sustainable loans may carry less default risk because of their long-term viability and alignment with regulatory trends.

In addition to loan controls, we include firm controls in the regressions, since uncontrolled borrower characteristics can bias the estimations. A healthy financial situation can encourage companies to integrate new sustainable projects into their core business strategy in order to differentiate themselves from competitors. Firm size corresponds to the natural logarithm of firm total assets. We employ the natural logarithm function to mitigate the high skewness of the variable, as traditionally done in the literature. Larger firms typically have more resources to invest in sustainability initiatives, making them more likely to get sustainable loans. Firm ROA is equal to the firm profit after tax divided by firm total assets, in percentage. More profitable firms may have additional funds to invest in new sustainable projects and are more likely to issue sustainable loans. Firm current ratio is measured by firm current assets divided by firm current liabilities. Firms with more liquidity can be more likely to finance new sustainable projects and apply for a sustainable loan. Firm liabilities to assets is defined as the ratio of firm total liabilities over firm total assets, in percentage. Firms with lower leverage, can have more resources to dedicate to sustainable projects. *Firm cash to assets* is equal to the firm cash divided by firm total assets, in percentage. Firms with more cash can be more willing to invest in new sustainability projects.

To reduce the risk that the observed effect of leaders' age is actually due to other bank characteristics rather than the age itself, we add bank controls to the model. *Bank size* refers to the natural logarithm of bank total assets. *Bank loans to assets* corresponds the ratio of bank loans to bank total assets, in percentage, and controls for the specialization of the bank. *Bank equity to assets* proxies bank financial stability and is equal to bank total equity divided by bank total assets, in percentage. *Bank ROA* measures the profitability of the bank with the ratio of bank profit after tax over bank total assets. Finally, *Bank number of top leaders* considers the number of top leaders in the bank, based on the work of Gambacorta et al. (2022). The

number of top leaders can influence the way decisions are made, which in turn can influence the adoption of sustainable lending practices.

All financial loan-, firm-, and bank-level financial controls are winsorized at the 5<sup>th</sup> and 95<sup>th</sup> percentiles to deal with extreme values. Following Gambacorta et al. (2022), firm and bank financial controls are lagged. This allows to reflect better the decision-making process, as the decision to lend can be taken based on the financial situation of the previous year. It also limits reverse causality issues by ensuring that explanatory variables are determined before the dependent variable. Table 5.2 provides the descriptive statistics of all the variables employed in the study. Definitions and sources of variables are presented in the Appendix.

### 5.3. Main estimations

Table 5.4 presents the results of our main estimations. To assess the robustness of these results, we consider four different model specifications with varying sets of explanatory variables, all of which include loan type, firm industry, bank country and year fixed effects.

In column (1), we include the main explanatory variable, *Bank mean top leaders age*, along with the fixed effects. In columns (2) to (4), we progressively add more controls: loan-level controls in column (2), firm-level controls in column (3), and finally bank-level controls in column (4).

The key finding is that the coefficient for *Bank mean top leaders age* is negative and significant across all model specifications, indicating that this result is not sensitive to the choice of explanatory variables. Therefore, a bank with older top leaders is significantly less likely to grant a sustainable loan. In other words, the age of the bank top leaders negatively affects the likelihood that the loan is sustainable. This supports the hypothesis that a higher presence of younger individuals in bank top management is beneficial for sustainable lending, because banks with younger top managers implement a more sustainability-oriented strategy in their lending policy. We interpret this result as a reflection of the stronger preference for sustainability among younger individuals, which is consistent with the literature that provides evidence of higher environmental concern among younger individuals (e.g., Gifford and Nilsson, 2014; Lewis, Palm and Feng, 2019). This finding may also be explained by the more conservative habits and values typically shared by older individuals (McCright and Dunlap, 2010).

This result is also economically significant. Based on the full model in column (4), a one-standard deviation increases in *Bank mean top leaders age* (4.413) decreases the probability that the loan is sustainable by 1.765 percentage point ( $-0.004 \times 4.413$ ). Comparing its effect with the other controls, *Bank mean top leaders* is significant, in contrast to many other variables which do not significantly affect sustainable lending. It also has a stronger effect than *Firm liabilities to assets* or than *Bank number of top leaders* on sustainable lending. Thus, the negative effect of the mean age of bank top leaders on sustainable lending is both statistically and economically significant.

Turning to the controls, the estimated coefficients have the expected effects. Concerning loan variables, *Loan maturity* and *Loan amount* consistently have significant and positive coefficient, supporting the view that sustainable projects necessitate larger investments and longer payback periods. *Loan covenant* and *Firm ROA* have an ambiguous relationship with *Sustainable loan. Firm liabilities to assets* has a negative and significant effect on sustainable loans, confirming that firms with lower leverage can have more resources to dedicate to sustainable projects. As well, *Firm cash to assets* is positively associated with *Sustainable loan*, indicating that firms with more cash are more willing to invest in new sustainable projects. *Bank size* and *Bank number of top leaders* have significant negative impacts on sustainable lending. Larger banks often led by larger boards, may be more focused on the maximization of efficiency and profitability rather than sustainable lending. Finally, the remaining variables, *Firm size, Firm current ratio, Bank loans to assets, Bank equity to assets*, and *Bank ROA* are not significant.

#### 5.4. Robustness checks

In this section, we evaluate the robustness of the main findings. First, we perform an instrumental variable analysis to address potential endogeneity issues. Next, we assess the sensitivity of the results by applying different regression methods. Finally, we verify the consistency of the outcomes by using alternative measures for sustainable lending and for the mean age of bank leaders.

#### 5.4.1. Instrumental variable approach

The findings may be influenced by endogeneity issues. In spite of the inclusion of a large set of controls at different levels, the results could be still driven by omitted variables that

may simultaneously influence both *Sustainable loan* and *Bank mean top leaders age*. Additionally, reverse causality issues may still affect the estimations. Banks that are more committed to sustainability may be able to recruit and attract more young leaders, who can be perceived as more concerned about sustainability.

To mitigate endogeneity issues, we perform instrumental variable probit regressions using the Maximum Likelihood Estimation (MLE) method. We employ Mean country bank top leaders age as an instrument, which corresponds the mean of the mean age of top leaders of the banks of the country, excluding the value of the mean age of bank top leaders of the observation. We expect the age of the country's top bank leaders to be closely related to the mean age of bank top leaders for several reasons. First, bank top leaders in a country are expected to have followed the same career path and therefore be of the same age. Bank top leaders start their careers after completing higher education. It may take a similar number of years for individuals in the same country to reach top management positions, such as bank board directors or top executives. Second, countries have policies that set retirement ages, which can similarly affect the upper age limit of bank managers from the same countries. Then, the social norms of the country may favor the appointment of people of the same age. For example, cultures that associate age with wisdom and reliability may appoint older people to top positions. Finally, economic cycles, such as growth or recession, or regulatory changes may influence hiring and promotion practices in the country, synchronizing career progression in the country's banking sector. Therefore, Mean country bank top leaders age appears to be a relevant instrument for the study.

In addition, there is no empirical or theoretical evidence suggesting that *Mean country bank top leaders age* directly impacts the sustainable lending practices of the bank. As we exclude the mean top leaders age of the bank in the calculation, this instrument does not directly explain the sustainable lending practices of the bank. This supports the validity of using *Mean country bank top leaders age* as an instrument in the analysis.

Table 5.5 presents the results from the outcome and structural equations of the IV probit regressions. Since we use the mean age of bank top leaders in the country of the bank, we omit bank country fixed effects in the instrumental variable models. These fixed effects account for characteristics of the bank country, which could absorb the effect of the instrument. Therefore, we include country control variables instead of the bank country fixed effects. We choose country controls that can be potential confounders distorting the relationship between the mean age of bank top leaders and *Sustainable loan*. We add *GDP per capita*, equal to the natural

logarithm of the GDP per capita of the country of the bank for the year of the loan contract. In richer countries, there may be a stronger societal emphasis on environmental protection and social welfare, encouraging banks to lend sustainable loans. *Environmental priority* proxies for the mean environmental concern of the population in the country of the bank. In countries with stronger environmental concerns, bank leaders may share stronger sustainable values which can increase the supply of sustainable financial products. This effect may also come from the demand side: individuals may seek out more sustainable products, which may encourage banks to offer sustainable products. Such countries may also have more policies, such as tax incentives, that encourage sustainable projects, which may lead banks to increase sustainable lending. We calculate this variable based on the mean answer to the following question from the Joint European Values Study 2017 & World Values Survey wave 7, in the country of the bank:

"Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own point of view? (1) Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. (2) Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent."

The variable has been recoded one when the respondent chooses the first answer, and zero for the second answer. The individuals surveyed by the Joint European Values Study & World Values Survey aim to be representative of the population of the country, which gives therefore a relevant view of the environmental attitudes in the country. Definitions and sources of these variables are provided in the Appendix.

We reconduct the four baseline models. We perform a Wald test of exogeneity to assess potential endogeneity in the probit main estimation models. The test is significant in the first three specifications, indicating that endogeneity may be indeed a concern in the analysis.

The structural equation results reveal a significant and positive relationship between *Mean country bank top leaders age* and *Bank mean top leaders age*. This finding suggests that banks in a country where the mean age of top leaders in banks is higher have also older top leaders, which supports the choice of the instrument.

The outcome equation results align with the main findings. In all models, the coefficients of *Bank mean top leaders age* are significantly negative. This supports the conclusion that banks with older top leaders are less likely to grant a sustainable loan compared

to conventional ones. Therefore, the main finding remains robust even after addressing potential endogeneity concerns.

By employing an instrumental variable approach and using *Mean country bank top leaders age* as an instrument, we strengthen the validity of the findings. The negative relationship between the age of bank top leaders and sustainable loans persists, suggesting that young bank leaders can promote sustainable lending. The analysis demonstrates that this relationship is robust, even when accounting for potential endogeneity issues.

#### 5.4.2. Alternative variables and sample

We examine the impact of alternative variables and sample for *Bank mean top leaders age* and *Sustainable loan* to assess the robustness of the findings. The results of probit regressions are displayed in Table 5.6. For these estimations, we employ the full baseline model with all fixed effects along with all control variables.

Since the dependent variable *Sustainable loan* aggregates all types of sustainable loans, green, social and sustainability-linked loans, we verify whether the main finding still holds for each type of sustainable loans. Sustainability-linked and green loans serve for different types of projects, so the effect of *Bank mean top leaders* age may be different on them. Therefore, we reconduct the model using these two alternative dependent variables in columns (1) and (2). We define *Sustainability-linked* loan, a dummy variable equal to one when the pricing of the loan is linked to the borrower's performance against pre-determined sustainability criteria, and zero otherwise. We measure *Green loan* with a dummy variable equal to one when the loan is used for green purposes, and zero otherwise. We find that the effect of mean age of bank top leaders remains significantly negative on both *Sustainability-linked loan* and *Green loan*, which is consistent with the main results. Hence, this effect concerns all types of sustainable loans, when considering them separately.

Second, we redo the estimations using an alternative explanatory variable for *Bank mean top leaders age*, in column (3). The implementation and execution of a sustainable loan may involve a broader group of leaders who are not board directors of top executives. Studying the age of all bank leaders can therefore provide a more comprehensive understanding of how the age of bank leaders influences sustainable lending. Moreover, leaders from all departments and from all levels can collectively influence lending decisions. For example, Altunbas et al. (2022) have found that more female managers within firms can decrease firms' carbon emissions. Hence, we create *Bank mean leaders age*, a continuous variable equal to the mean

age of directors and managers from all departments in the bank. This variable encompasses a wide range of directors and managers, working in administration, finance and accounting, customer services, marketing, legal and compliance or human resources. Similarly, we replace the control variable *Bank number of top leaders* by *Bank number of leaders*, equal to the number of all bank leaders. We find a significant and negative effect of *Bank mean leaders age* on *Sustainable loan*, which confirms the main findings and shows that the effect is not limited to bank top leaders but includes other leaders of the bank.

Finally, we reconduct the estimation using an alternative sample. In the sample, 43.72% of the loans were issued in the USA. The main finding that sustainable loans are less likely to be granted by banks with older leaders may be driven by the US loans. Therefore, we rerun the model by excluding the loans issued in the USA, in column (4). The coefficient for *Bank mean top leaders age* is negative and significant, indicating that sustainable loans are less likely to be granted by older bank top leaders. Hence, this effect still holds when considering the other countries.

Hence, these robustness checks using alternative dependent and explanatory variables and alternative sample reinforce the conclusion that sustainable loans are less likely granted by bank with old leaders, since the negative relationship between sustainable loan and the age of bank leaders remains consistent across all models.

#### 5.4.3. Alternative regression models

We perform further regression estimations to verify the robustness of the results, presented in Table 5.7 and Table 5.8. Since the dependent variable, *Sustainable loan*, is binary, we first conduct a logistic regression in Table 5.7, using the same four models as before. In all models, the explanatory variable *Bank mean top leaders age* has a negative and significant effect on *Sustainable loan*.

Next, as the dependent variable is a dummy, we run Linear Probability Model (LPM) regressions to investigate the impact of the mean age of bank top leaders on sustainable lending, presented in Table 5.8. Similarly, *Bank mean top leaders age* has a negative and significant coefficient in each model or the four models. These consistent results from both logistic and LPM regressions strengthen the conclusion that younger top leaders can foster sustainable lending.

### 5.5. Additional estimations

So far, this research indicates that the mean age of bank top leaders affects negatively the probability that the loan is sustainable. To disentangle this effect, this section now examines whether it varies by generation and age composition. These further analyses aim to identify which specific generation influences sustainable lending and to go deeper in explaining the main finding: whether sustainable lending is promoted by the sustainability concerns of young leaders or hindered by the conservative values of older individuals. Then, testing for generation and age composition also allows to capture a potential non-linear effect of age on sustainable lending. This section can also serve as a robustness check for the main findings, as we expect the effect to be positive for younger generations and negative for older ones.

#### 5.5.1. Generations

First, we test whether this effect is generational. While this main finding can be explained by the stronger environmental concerns and sustainable preferences of young people, these values are strongly linked to age generations. People of the same generation experience the same events, economic conditions and social changes that can influence their awareness and attitudes towards sustainability. A number of papers examining the effect of age on environmental sustainability behavior distinguish between generations. They find evidence that millennials (25-40 years old) are more environmentally aware than others: they believe in global warming and climate change more than others (Pew Research Center, 2018; Ross, Rouse and Mobley, 2019). More generally, they are more concerned about current issues related to sustainability (Smith and Brower, 2012). Therefore, we hypothesize that a higher proportion of millennials in the top management of banks increases the likelihood of sustainable lending, while we expect insignificant or negative effects for the others.

However, the effect of the silent generation (over 75 years old) on sustainable lending may not be so obvious. Gifford and Nilsson (2014) point out that this generation may be more likely to engage in pro-environmental behavior than younger generations, as restrictive events, such as the war experience in the 40s, have shaped their practices. Therefore, the impact of the silent generation on sustainable lending may also be positive.

To test these hypotheses, we define four generation variables, equal to the proportion of individuals of the generation among bank top leaders, in percentage, following previous studies on age generations. *Bank millennials top leaders, Bank gen X top leaders, Bank*  *boomers top leaders* and *Bank silent gen top leaders* respectively measure the proportion of millennials (under 40 years old), generation X (40-60 years old), baby boomers (60-75 years old) and silent generation (over 75 years old). Baby boomers are in majority: in average they are represent 49.766% of the top leaders of the bank. Table 5.2 provides the descriptive statistics for these variables. Definitions and sources are presented in the Appendix.

To examine their effects, we run probit regressions with the dependent variable *Sustainable loan*, based on the full baseline model. Column (1) in Table 5.9 outlines the marginal effects of the probit regressions for the effect of age generation on sustainable lending. The specification includes all fixed effects and all control variables, standard errors are clustered at the loan level. As the baby boomers generation represents the majority of the bank top leaders, the baseline generation variable for this estimation is *Bank boomers top leaders*.

In column (1), we observe that *Bank millennials top leaders* is significantly positive, while *Bank gen X top leaders* is insignificant, and *Bank silent gen top leaders* is significantly negative. Overall, these differences in generation effects indicate that the effect of bank leaders' age on sustainable lending is generational. The results confirm the hypothesis that the higher presence of millennials in particular significantly increases the likelihood that the loan is sustainable. This can be interpreted as millennials' pro-sustainability concerns leading them to lend more to sustainable companies compared to other generations. The significant negative effect found for the silent generation also supports the hypothesis that older bank managers lend less sustainably due to their greater conservatism and focus on business and economic growth (McCright and Dunlap, 2010). Comparing the two coefficients, the millennial generation has a stronger effect than the silent generation on the probability that the loan is sustainable. In particular, the presence of millennials in the top management of the bank increases the likelihood that the loan will be sustainable. Finally, these results confirm the main finding that the probability that the loan is sustainable decreases with the age of the bank top leaders.

These results are also economically significant. A one-standard deviation increase (2.385) in *Bank millennials top leaders* increases by 1.431 ( $0.006 \times 2.385$ ) percentage point the probability that the loan is sustainable. As well, a one-standard deviation increase in *Bank silent generation* (7.925) decreases the probability that the loan is sustainable by 1.585 (-0.002  $\times$  7.925) percentage point.

Therefore, these results both underscore the main finding that the probability that a loan is sustainable decreases with bank leaders age and indicate that the presence of millennials bank leaders in particular fosters sustainable lending.

#### 5.5.2. Age composition

In addition, we explore the influence of age composition on sustainable lending by examining the effects of both the youngest and the oldest among the bank top leaders. By testing for the effects of both the youngest and the oldest bank leaders, we can capture the effects that leaders at the ends of the age spectrum may have on sustainable lending. The presence of the youngest leader may increase the likelihood that the loan is sustainable. Conversely, banks with top leaders with a higher maximum age may be less likely to engage in sustainable practices.

To test these hypotheses, we define *Bank minimum top leaders age* and *Bank maximum top leaders age*, respectively equal to the minimum and the maximum age among the top leaders of the bank. Looking at the statistics, bank top leaders are aged between 30 and 98 years old. Summary statistics for these variables are provided in Table 5.2, their definitions and sources in the Appendix.

Table 5.9 provide the results based on the full baseline model. Columns (2) et (3) include respectively *Bank minimum top leaders age* and *Bank maximum top leaders age* to test the age composition.

Bank minimum top leaders age exerts a significantly negative effect on the probability of sustainable lending while Bank maximum top leaders age has no significant effect. This indicates that the presence of the youngest bank top leaders in particular influences the probability that the loan is sustainable. This confirms the main finding that the presence of young bank leaders increases sustainable lending. It also underscores the previous result that this effect is driven by young bank leaders in particular compared to old ones. Sustainable lending is therefore especially fostered by young leaders, because of their greater environmental concern and sustainability commitment.

Finally, the effect of *Bank minimum top leaders age* is also economically significant. Increasing by one standard deviation (6.991) *Bank minimum top leaders age*, decreases the probability of sustainable lending by  $1.276 (-0.002 \times 6.991)$  percentage point.

Overall, the main estimations show that the average bank top leaders age influences sustainable lending, bank leaders age composition also matters. Examining the effect of bank

top leaders age composition reveals that the presence of young bank top leaders in particular fosters sustainable lending, that can be explained by greater environmental concerns and sustainability commitment shared by young leaders. This suggests that young bank top leaders promote sustainable lending practices.

### 5.6. Conclusion

This paper examines the effect of the age of bank managers on sustainable lending. To do so, we match loan-, firm- and bank-level data to construct a sample of about 16,000 loanbank pairs from the syndicated loan market. The empirical analysis reveals a significant negative relationship between the age of bank top leaders and sustainable lending, suggesting that older bank top leaders are less likely to lend sustainably. This result is also economically significant: a one-standard deviation increase in the average age of bank leaders reduces the probability that the loan is sustainable by 1.765 percentage points. This result still holds when endogeneity issues are addressed, when alternative econometric methods are used, and when alternative variables or samples are employed. We can explain this finding by the stronger environmental concerns and commitment to sustainability of young people and the more conservative values of older people.

Further analysis then examines whether this depends on generation and age composition. They show that the effect is generational: a higher proportion of millennials among bank top leaders increases the likelihood that the loan is sustainable, while the reserve holds for the silent generation. Similarly, the youngest top leaders are associated with a higher likelihood of sustainable lending. In particular, sustainable lending is driven by the presence of young leaders in the bank rather than hindered by older ones. This suggests that the higher level of environmental concern and commitment to sustainability among young leaders leads them to make sustainable loans.

This research has important direct implications for companies seeking to finance sustainable projects. Such firms may consider the age of bank top leaders when selecting their financial partner in order to optimize their access to credit. In addition, this study has concrete implications for banks wishing to adopt more sustainable practices. Banks need to consider age diversity in order to integrate sustainability into their strategies. In addition, these findings may provide incentives for public authorities to implement policies related to the age of leaders in order to foster sustainability. Overall, these findings deepen the understanding of how age can drive sustainable lending. A greater presence of young leaders can help to promote sustainable practices in the financial sector. A generational shift in the top leadership positions of financial institutions could lead to a lasting change in the role of financial institutions towards sustainability. By increasing sustainable lending, financial institutions contribute to the achievement of global sustainability goals. Further research could extend these conclusions by investigating what other factors drive sustainable practices within banks.

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## Tables

# Table 5.1.Sustainable loans by bank country

This table provides the repartition of sustainable loans across bank countries.

Country of the bank	Sustainable loan=0	Sustainable loan=1	Percentage of sustainable loans
Taiwan	27	1	3.57%
Australia	80	47	37.01%
Austria	135	50	27.03%
Belgium	51	20	28.17%
Brazil	6	13	68.42%
Canada	2,127	255	10.71%
China	177	48	21.33%
Colombia	10	4	28.57%
Denmark	69	48	41.03%
Finland	104	55	34.59%
France	1,826	940	33.98%
Germany	877	209	19.24%
Greece	12	3	20.00%
Hong Kong	20	4	16.67%
Ireland	65	13	16.67%
Italy	536	137	20.36%
Japan	1,139	407	26.33%
Luxembourg	11	4	26.67%
Netherlands	504	231	31.43%
Nigeria	10	1	9.09%
Norway	134	56	29.47%
Poland	42	28	40.00%
Singapore	42	18	30.00%
South Africa	22	6	21.43%
Spain	836	398	32.25%
Sweden	17	9	34.62%
Switzerland	217	14	6.06%
United Arab Emirates	9	7	43.75%
United Kingdom	1,143	262	18.65%
United States	2,384	145	5.73%
Total	12,632	3,433	21.37%

# Table 5.2.Descriptive statistics

This table reports the descriptive statistics for the variables employed in this study. Definitions of all variables are provided in the Appendix.

Variable	Level	Observations	Mean	Standard deviation	Minimum	Maximum
Sustainable loan	Loan	16,065	0.214	0.410	0	1
Sustainability-linked loan	Loan	16,065	0.149	0.356	0	1
Green loan	Loan	16,065	0.048	0.215	0	1
Bank mean top leaders age	Bank	16,065	60.447	4.413	43	78
Bank minimum top leaders age	Bank	16,065	50.226	6.379	30	78
Bank maximum top leaders age	Bank	16,065	71.108	6.991	43	98
Bank millennials top leaders	Bank	16,065	0.337	2.385	0	50
Bank gen X top leaders	Bank	16,065	46.339	26.836	0	100
Bank boomers top leaders	Bank	16,065	49.766	25.515	0	100
Bank silent gen top leaders	Bank	16,065	3.557	7.925	0	100
Mean country bank top leaders age	Bank	16,065	60.400	3.684	52.777	65.825
Bank mean leaders age	Bank	16,065	59.473	3.689	46.500	78.000
Loan amount	Loan	16,033	12.076	1.642	8.936	14.732
Loan maturity	Loan	15,656	3.859	0.504	2.485	4.431
Loan covenant	Loan	16,065	0.109	0.312	0	1
Firm size (t-1)	Firm	7,604	14.934	1.984	11.136	18.180
Firm ROA (t-1)	Firm	7,326	4.368	5.388	-4.362	16.857
Firm current ratio (t-1)	Firm	7,498	1.416	0.865	0.303	3.662
Firm liabilities to assets (t-1)	Firm	7,602	64.119	19.327	28.336	99.430
Firm cash to assets (t-1)	Firm	7,395	6.712	6.051	0.083	21.199
Bank size (t-1)	Bank	16,065	20.162	1.134	17.332	21.345
Bank loans to assets (t-1)	Bank	16,062	44.885	14.887	20.348	69.688
Bank equity to assets (t-1)	Bank	16,065	6.241	2.476	2.714	10.974
Bank ROA (t-1)	Bank	14,588	0.631	0.406	-0.020	1.339
Bank number of top leaders	Bank	16,065	15.857	10.479	1	64
Bank number of leaders	Bank	16,065	173.022	423.835	3	3332
GDP per capita	Country of the bank	16,037	10.953	0.235	8.643	11.828
Environmental priority	Country of the bank	15,857	36.315	5.099	11.160	58.644

# Table 5.3.Sustainable loans by firm industry

This table provides the repartition of sustainable loans across firm industries, based on the two-digit NAICS codes.

Firm industry	Sustainable loan=0	Sustainable loan=1	Percentage of sustainable loans
Agriculture, forestry, fishing and hunting	95	68	41.72%
Mining	608	79	11.50%
Utilities	972	692	41.59%
Construction	450	216	32.43%
Manufacturing	3,117	720	18.76%
Wholesale trade	593	140	19.10%
Retail trade	595	118	16.55%
Transportation and warehousing	770	200	20.62%
Information	1,115	161	12.62%
Real estate rental and leasing	766	269	25.99%
Professional, scientific and and technical services	765	137	15.19%
Management of companies and enterprises	680	179	20.84%
Administrative and support and waste management and remediation services	1,114	264	19.16%
Educational services	58	29	33.33%
Health care and social assistance	319	11	3.33%
Arts, entertainment, and recreation	173	25	12.63%
Accomodation and food services	325	55	14.47%
Other services (except public administration)	88	68	43.59%
Public administration	29	2	6.45%
Total	12,632	3,433	21.37%

## Table 5.4.Main estimations

This table presents the results of probit regressions. The dependent variable is *Sustainable loan*. Standard errors are reported in parentheses, and clustered at the loan level. The reported coefficients are marginal effects. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)	(4)
Bank mean top leaders age	-0.002**	-0.002**	-0.004***	-0.004**
	(0.001)	(0.001)	(0.001)	(0.002)
Loan maturity		0.045***	0.090***	0.076***
		(0.015)	(0.028)	(0.028)
Loan amount		0.014***	0.022**	0.022**
		(0.005)	(0.010)	(0.011)
Loan covenant		0.007	-0.086***	-0.081***
		(0.024)	(0.030)	(0.031)
Firm size (t-1)			0.001	0.006
			(0.009)	(0.009)
Firm ROA (t-1)			-0.004*	-0.003
			(0.002)	(0.002)
Firm current ratio (t-1)			-0.011	-0.010
			(0.014)	(0.014)
Firm liabilities to assets (t-1)			-0.002***	-0.002***
			(0.001)	(0.001)
Firm cash to assets (t-1)			0.007***	0.007***
			(0.002)	(0.002)
Bank size (t-1)				-0.024***
				(0.008)
Bank loans to assets (t-1)				0.001
				(0.001)
Bank equity to assets (t-1)				0.002
				(0.004)
Bank ROA (t-1)				-0.012
				(0.022)
Bank number of top leaders				-0.002***
				(0.001)
Loan type FE	Yes	Yes	Yes	Yes
Firm industry FE	Yes	Yes	Yes	Yes
Bank country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	16,065	15,652	6,903	6,056
Pseudo R-squared	0.131	0.136	0.133	0.132

#### Table 5.5. Instrumental variable approach

This table presents the results of the MLE instrumental variable probit models. The upper part of the table displays the results of the outcome equation. *Bank mean top leaders age* is instrumented by *Mean country bank top leaders age*. The dependent variable is *Sustainable loan*. Standard errors are given in parentheses, and clustered at the loan level. The lower part of the table shows the results of the structural equation with the dependent variable *Bank mean top leaders age*, as well as exogeneity test. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)	(4)
Bank mean top leaders age	-0.071***	-0.068***	-0.058***	-0.027***
	(0.004)	(0.004)	(0.007)	(0.008)
Loan controls	No	Yes	Yes	Yes
Firm controls	No	No	Yes	Yes
Bank controls	No	No	No	Yes
Country controls	Yes	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes	Yes
Firm industry FE	Yes	Yes	Yes	Yes
Bank country FE	No	No	No	No
Year FE	Yes	Yes	Yes	Yes
Observations	15,829	15,421	6,831	6,078
Structural equation				
Mean country bank top leaders age	0.966***	0.960***	0.971***	0.998***
	(0.009)	(0.009)	(0.014)	(0.016)
Exogeneity test				
Wald chi-2 statistic	118.15***	101.59***	22.13***	0.06

## Table 5.6.Alternative variables and sample

This table presents the results of probit regressions. The dependent variables are *Sustainability-linked loan*, *Green loan* and *Sustainable loan* for the last two columns. Standard errors are reported in parentheses, and clustered at the loan level. The reported coefficients are marginal effects. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	Sustainability- linked loan	Green loan	Sustainable loan	Sustainable loan Without US loans
Bank mean top leaders age	-0.003*	-0.002*		-0.027***
	(0.001)	(0.001)		(0.007)
Bank mean leaders age			-0.004**	
			(0.002)	
Loan controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes	Yes
Firm industry FE	Yes	Yes	Yes	Yes
Bank country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	5,964	4,647	6,056	4,059
Pseudo R-squared	0.123	0.191	0.131	0.119

### Table 5.7. Logit model

This table presents the results of logit regressions. The dependent variable is *Sustainable loan*. Standard errors are reported in parentheses, and clustered at the loan level. The reported coefficients are marginal effects. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)	(4)
Bank mean top leaders age	-0.003**	-0.003**	-0.004**	-0.004**
	(0.001)	(0.001)	(0.002)	(0.002)
Loan controls	No	Yes	Yes	Yes
Firm controls	No	No	Yes	Yes
Bank controls	No	No	No	Yes
Loan type FE	Yes	Yes	Yes	Yes
Firm industry FE	Yes	Yes	Yes	Yes
Bank country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	16,065	15,652	6,903	6,056
Pseudo R-squared	0.131	0.135	0.134	0.133

# Table 5.8.Linear probability model

This table presents the results of Linear Probability Model (LPM) regressions. The dependent variable is *Sustainable loan*. Standard errors are reported in parentheses, and clustered at the loan level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

(1)	(2)	(3)	(4)
-0.002**	-0.002**	-0.004***	-0.004***
(0.001)	(0.001)	(0.001)	(0.002)
No	Yes	Yes	Yes
No	No	Yes	Yes
No	No	No	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
16,065	15,652	6,931	6,134
0.121	0.124	0.126	0.131
	(1) -0.002** (0.001) No No Yes Yes Yes Yes Yes 16,065 0.121	(1)(2)-0.002**-0.002**(0.001)(0.001)NoYesNoNoNoNoYesYesYesYesYesYesYesYesYesYes16,06515,6520.1210.124	(1)(2)(3)-0.002**-0.002**-0.004***(0.001)(0.001)(0.001)NoYesYesNoNoYesNoNoYes16,06515,6526,9310.1210.1240.126

## Table 5.9.Additional estimations

This table presents the results of probit regressions. The dependent variable is *Sustainable loan*. Standard errors are reported in parentheses, and clustered at the loan level. The reported coefficients are marginal effects. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively. Definitions of all variables used in this table are provided in the Appendix.

	(1)	(2)	(3)
Bank millennials top leaders	0.006***		
	(0.002)		
Bank gen X top leaders	-2.436e-04		
	(2.953e-04)		
Bank silent gen top leaders	-0.002***		
	(0.001)		
Bank minimum top leaders age		-0.002*	
		(0.001)	
Bank maximum top leaders age			-0.002
			(0.001)
Loan controls	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes
Firm industry FE	Yes	Yes	Yes
Bank country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	6,056	6,056	6,056
Pseudo R-squared	0.134	0.132	0.132

## Appendix

Variable	Definition	Source
Dependent variables		
Sustainable loan	Dummy equal to one if:	Refinitiv Eikon &
	- The loan is used for green purposes (i.e.,	own calculations
	Green loan=1);	
	or	
	- The loan is used for social purposes ;	
	or	
	- The pricing of the loan is linked to the	
	borrower's performance against pre-	
	determined sustainability criteria (i.e.,	
	Sustainability-linked loan=1);	
	or	
	- The borrower has a sustainable activity,	
	classified as: "Renewable Energy Equipment	
	& Services, Wind Systems & Equipment,	
	Stationary Fuel Cells, Photovoltaic Solar	
	Systems & Equipment, Thermal Solar Systems	
	& Equipment, Biomass Power Energy	
	Equipment, Waste to Energy Systems &	
	Equipment, Hydropower Equipment, Wave	
	Power Energy Equipment, Renewable Energy	
	Services, Geothermal Equipment, Renewable	
	Fuels, Biodiesel, Ethanol Fuels, Pyrolytic &	
	Synthetic Fuels, Biomass & Biogas Fuels,	
	Hydrogen Fuel, Carbon Capture & Storage,	
	Electrical Vehicles, Sustainable & Energy	
	Efficient Home Builders, Organic Farming,	
	Power Charging Stations, Alternative Electric	
	Utilities, Hydroelectric & Tidal Utilities, Solar	
	Electric Utilities, Wind Electric Utilities,	
	Biomass & Waste to Energy Electric Utilities,	
	Geothermal Electric Utilities, Independent	
	Power Producers, Renewable IPPs".	
Green loan	Dummy equal to one if the loan is used for	Refinitiv Eikon
	green purposes.	
Sustainability-linked loan	Dummy equal to one if the pricing of the loan	Refinitiv Eikon
2	is linked to the borrower's performance against	
	pre-determined sustainability criteria	
Independent variables		
D 1 1 1		

## Definitions and sources of variables

Bank leaders age
Bank mean top leaders age	Mean age of bank board directors and top executives at the year of loan issuance. Bank board directors and top executives include all directors and managers whose job description includes " <i>Board of directors</i> ", " <i>Executive</i> <i>committee</i> " or " <i>Executive board</i> ".	Bankfocus & own calculations
Bank minimum top leaders age	The minimum age among of bank board directors and top executives.	Bankfocus & own calculations
Bank maximum top leaders age	The maximum age among bank board directors and top executives.	Bankfocus & own calculations
Bank millennials top leaders	Percentage of bank board directors and top executives aged under 40.	Bankfocus & own calculations
Bank gen X top leaders	Percentage of bank board directors and top executives aged 40-60.	Bankfocus & own calculations
Bank boomers top leaders	Percentage of bank board directors and top executives aged 60-75.	Bankfocus & own calculations
Bank silent gen top leaders	Percentage of bank board directors and top executives aged 75 and over.	Bankfocus & own calculations
Mean country bank top leaders age	Mean of the mean age of board directors and top executives of the banks of the country. The mean is calculated without the value of the mean bank board directors and top executives age of the observation.	Bankfocus & own calculations
Bank mean leaders age	Mean age of bank leaders. Bank leaders include all directors and managers of the bank from all departments.	Bankfocus & own calculations
Loan controls		
Loan amount	Natural logarithm of the amount of the loan (millions USD).	Refinitiv Eikon & own calculations
Loan maturity	Natural logarithm of the maturity of the loan. Maturity is defined as the number of months between the date of signature of the loan contract and the date on which the principal amount of the issue comes due.	Refinitiv Eikon & own calculations
Loan covenant	Dummy equal to one when the loan agreement contains covenants. Covenants are certain conditions that the borrower agrees to maintain during the life of the loan.	Refinitiv Eikon
Firm controls		
Firm size (t-1)	Natural logarithm of firm lagged total assets, (thousands USD).	Refinitiv Eikon & own calculations
Firm ROA (t-1)	Lagged ratio of firm profit after tax over firm total assets (%).	Refinitiv Eikon & own calculations
Firm current ratio (t-1)	Lagged ratio of firm current assets over firm current liabilities.	Refinitiv Eikon & own calculations
Firm liabilities to assets (t-1)	Lagged ratio of firm total liabilities over firm total assets (%).	Refinitiv Eikon & own calculations

Chapter 5 – Young Leaders, Sustainable Lenders? How Bank Leaders' Age Influences Sustainable			
Lending			

Firm cash to assets (t-1)	Lagged ratio of firm cash over firm total assets (%).	Refinitiv Eikon & own calculations
Bank controls		
Bank size (t-1)	Natural logarithm of bank lagged total assets (thousands USD).	Bankfocus & own calculations
Bank loans to assets (t-1)	Lagged ratio of bank loans over bank total assets (%).	Bankfocus & own calculations
Bank equity to assets (t-1)	Lagged ratio of bank equity over bank total assets (%).	Bankfocus & own calculations
Bank ROA (t-1)	Lagged ratio of bank profit after tax over bank total assets (%).	Bankfocus & own calculations
Bank number of top leaders	Number of bank board directors and top executives.	Bankfocus & own calculations
Bank number of leaders	Number of bank leaders. Bank leaders include all directors and managers of the bank from all departments.	Bankfocus & own calculations
Country controls		
GDP per capita	Natural logarithm of the GDP per capita of the country of the bank and for the year of the loan closing date (PPP, constant 2021 international dollar).	World Development Indicators
Environmental priority	Mean answer to the following question in the country of the bank, in percentage: " <i>Here are</i> <i>two statements people sometimes make when</i> <i>discussing the environment and economic</i> growth. Which of them comes closer to your own point of view? (1) Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. (2) Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent." The variable has been recoded 0 when the respondent chooses the first answer and 1 for the second answer.	Joint European Values Study & World Values Survey (2017- 2022)

## **Conclusion Générale**

Les banques sont communément associées aux activités d'épargne, de crédit et aux services de paiement. Cependant, les banques jouent également un rôle essentiel en influençant le développement de la société. En réaffectant les ressources financières à des projets spécifiques ou à certains individus, l'intermédiation financière effectuée par les banques influence les opportunités d'investissement des individus et le développement des entreprises. Cette thèse a donc examiné comment les banques peuvent promouvoir le développement sociétal en réallouant les ressources vers certains projets ou individus, favorisant le développement économique et le bien-être sociétal.

De la même manière, la société peut guider et façonner les pratiques bancaires en veillant à ce qu'elles soient alignées sur les valeurs et les objectifs de la société. Les individus et les institutions influencent les pratiques bancaires, notamment par la mise en œuvre de réglementations et par les normes sociales qu'ils intègrent. La question n'est donc pas seulement de comprendre comment les banques peuvent contribuer au développement de la société, mais aussi comment la société peut orienter les banques à entreprendre des stratégies inclusives et responsables. Cette question conduit à considérer les banques à la fois comme un moteur du développement sociétal, mais aussi comme un système soumis à l'influence de la société. Cette thèse vise donc à explorer l'interaction entre les banques et la société dans cinq essais empiriques indépendants mais thématiquement liés.

Le premier chapitre examine l'impact de l'inflation sur la confiance dans les banques. Les résultats indiquent que l'inflation, qu'elle soit récente ou vécue tout au long de la vie, détériore la confiance dans les banques des individus, ce qui montre que l'inflation exerce des effets à court et à long termes sur la confiance dans les banques. De plus, des caractéristiques individuelles telles que l'éducation et l'accès à l'information modèrent l'effet négatif de l'inflation sur la confiance dans les banques. La lutte contre l'inflation permet donc d'éviter une baisse durable de la confiance dans les banques.

Alors que le premier chapitre étudie les déterminants de la confiance des individus dans les banques, le deuxième chapitre examine ses conséquences sur l'inclusion financière. Nous montrons un impact positif significatif de la confiance dans les banques sur l'inclusion financière. Cet effet touche tous les individus, indépendamment de leurs caractéristiques sociodémographiques ou de leur situation financière, et n'est pas lié au pays ou à l'année. Ainsi, la promotion de la confiance dans les banques peut améliorer l'inclusion financière.

Mais l'inclusion financière améliore-t-elle la vie des individus ? Le chapitre trois tente de répondre à cette question en examinant si l'inclusion financière influence la satisfaction dans la vie. Il démontre que l'inclusion financière améliore la satisfaction dans la vie. Cet effet positif se traduit par une amélioration de la santé, de l'éducation et, dans une moindre mesure, par la création d'une entreprise. Il est plus fort dans les pays riches et plus faible dans les pays récemment touchés par une crise financière. Les politiques de promotion de l'inclusion financière peuvent contribuer à améliorer le bonheur des individus.

Les deux chapitres suivants continuent d'explorer la manière dont les banques peuvent promouvoir le développement sociétal, mais répondent également à la manière dont la société peut façonner les pratiques bancaires. Le chapitre quatre traite de l'effet du genre des dirigeants des banques sur l'accès au crédit des entreprises. Nous constatons qu'une proportion plus élevée de femmes parmi les dirigeants des banques entraîne une diminution de la dette bancaire des entreprises, en lien avec l'aversion au risque plus élevée des femmes. D'autres résultats indiquent que cet effet dépend de la maturité de la dette bancaire des entreprises, puisqu'une plus grande proportion de femmes dirigeantes contribue à une diminution des dettes bancaires de long terme, mais à une augmentation des dettes bancaires de court terme. De plus, les dirigeantes entravent l'endettement bancaire des entreprises dirigées par des hommes uniquement. Une proportion de dirigeantes plus importante affecte l'allocation du crédit.

Si le genre des dirigeants des banques influence les pratiques bancaires, leur âge peutil également avoir un impact ? Le chapitre cinq répond à cette question en examinant si l'âge des dirigeants des banques influence les prêts durables. Le principal résultat est que les prêts durables sont nettement moins susceptibles d'être accordés par une banque dont les membres du conseil d'administration et des comités exécutifs sont plus âgés, ce qui va dans le sens de l'idée que les jeunes sont plus préoccupés par le développement durable. Cet effet est également générationnel : les prêts durables sont plus susceptibles d'être accordés par une banque comptant un plus grand nombre de milléniaux, alors que l'inverse est vrai pour la génération silencieuse. La présence des plus jeunes dirigeants des banques, plutôt que des plus âgés, influence les prêts durables. Les jeunes dirigeants des banques peuvent promouvoir le développement durable.

Globalement, le message clé de cette thèse est que les banques et la société s'influencent mutuellement. Le secteur bancaire peut promouvoir le développement sociétal et le bien-être individuel en améliorant l'inclusion financière des individus et l'accès au crédit des entreprises. L'allocation des ressources financières à des projets et à des groupes d'individus spécifiques peut favoriser le bien-être et l'égalité au sein de la société. Inversement, la société façonne les pratiques bancaires par la mise en œuvre de réglementations et par les normes sociales intégrées par les agents bancaires, ce qui peut permettre d'aligner les pratiques bancaires sur les intérêts de la société. Cette thèse permet de mieux comprendre la relation entre les banques et la société.

Cette thèse a d'importantes implications politiques. Tout d'abord, il est primordial de préserver la confiance dans les banques, car elle est fragile et difficile à restaurer. Cette confiance est cependant cruciale car elle favorise l'utilisation des services financiers. Par conséquent, les décideurs politiques devraient mettre en œuvre des politiques qui favorisent la confiance dans les banques afin de promouvoir le développement financier et économique au niveau macroéconomique, ainsi que le bien-être des individus au niveau microéconomique.

De plus, l'accès aux services financiers et leur utilisation permettent aux individus de consommer et d'investir dans des opportunités. Par conséquent, étant donné le rôle primordial de l'inclusion financière dans le bien-être des individus, les décideurs politiques devraient se concentrer sur la promotion de l'inclusion financière non seulement pour des objectifs économiques, mais aussi pour améliorer le bonheur et, plus largement, le bien-être de la société.

Troisièmement, considérant que les caractéristiques des dirigeants des banques affectent les pratiques bancaires, les décideurs politiques peuvent utiliser des législations telles que les quotas pour influencer l'allocation des prêts. Cela peut permettre de favoriser certaines entreprises ou certains secteurs, afin d'aligner les pratiques bancaires sur les valeurs de la société. En particulier, la promotion de quotas de genre peut favoriser l'accès au crédit des entreprises dirigées par des femmes, renforçant ainsi l'autonomie financière des femmes. De même, encourager les jeunes à occuper des postes de direction peut favoriser le développement durable. Cette thèse offre des pistes pour de futures recherches. Tout d'abord, cette thèse ne se concentre que sur certains aspects des banques ou de la société. La société ayant de nombreuses dimensions, des recherches plus approfondies pourraient clarifier la manière dont d'autres aspects de la société façonnent les pratiques bancaires. En particulier, les conséquences de la culture sur la finance restent largement inexplorées, ce qui souligne la nécessité d'identifier l'impact de la culture sur les pratiques financières. En outre, les questions sociétales peuvent refléter un large éventail de problèmes auxquels la société est confrontée. Récemment, de plus en plus d'ouvrages ont examiné l'impact des pratiques bancaires sur les questions environnementales<sup>25</sup>. Des recherches supplémentaires dans ce domaine pourraient apporter des contributions significatives. Enfin, bien que cette thèse se soit principalement concentrée sur l'inclusion financière et les prêts bancaires, les services financiers englobent diverses pratiques financières telles que l'investissement ou la gestion d'actifs. Des recherches futures pourraient explorer la relation entre la société et d'autres aspects de la finance.

Deuxièmement, cette recherche se heurte souvent aux limites des données, ce qui suggère des orientations pour des futures recherches. En particulier, les questionaires LiTS fournissent des informations pour une zone géographique spécifique, dont les résultats peuvent différer de ceux du reste du monde. Les questions posées dans les questionnaires sont également limitées. Par exemple, les questionnaires ne permettent d'étudier que la possession d'un compte bancaire, alors que les individus peuvent posséder un compte bancaire mais ne pas l'utiliser fréquemment. L'inclusion financière pourrait également être mesurée par d'autres variables, telles que l'utilisation de services financiers en ligne. De plus, les enquêtes n'incluent souvent pas d'autres variables qui pourraient être pertinentes pour l'étude, telles que la littéracie financière des individus ou l'inflation perçue. Qui plus est, les bases de données utilisées dans ce document sont transversales et ne contiennent pas d'informations sur les mêmes individus ou dirigeants de banques sur plusieurs années. Il pourrait donc être difficile d'inférer correctement la causalité dans les résultats. Par conséquent, la création de bases de données complètes et publiques sur la confiance dans les banques ou l'inclusion financière permettrait d'apporter de nouvelles contributions à la littérature.

<sup>&</sup>lt;sup>25</sup> L'article de De Haas (2023) étudie la littérature sur les banques et les problèmes environnementaux. Référence : De Haas, R. (2023). *Sustainable banking*. SSRN Working Paper No. 4620166.

Enfin, les résultats doivent être interprétés avec prudence. En raison des bases de données limitées, les canaux sous-jacents par lesquels les effets entre les banques et la société se produisent ne peuvent qu'être supposés sur la base de la littérature antérieure. Par exemple, pour expliquer l'effet du genre des dirigeants des banques sur l'accès au crédit des entreprises, l'aversion au risque plus élevée des femmes n'est pas testée empiriquement dans l'échantillon. De même, la plus grande préoccupation des jeunes dirigeants de banque pour la durabilité est supposée sur la base de précédents travaux, mais n'est pas directement observée dans l'échantillon. Bien que les résultats de cette thèse fournissent des informations importantes sur la relation entre les banques et la société, ils doivent être interprétés avec précaution. Des recherches plus approfondies sur les mécanismes de ces relations pourraient conduire à l'élaboration de politiques plus efficaces et à la promotion d'un développement durable et inclusif de la société.





## Axelle HEYERT Essays on Banking and Society

## Résumé

Cette thèse étudie la relation entre les banques et la société. Elle contribue à mieux comprendre l'influence des pratiques bancaires sur la société et inversement, l'influence de la société sur les pratiques bancaires. Pour explorer ce sujet, cette thèse présente cinq articles empiriques indépendants mais thématiquement liés. Le premier chapitre étudie l'effet de l'inflation sur la confiance dans les banques. Il démontre que l'inflation récente et l'inflation moyenne vécue tout au long de la vie détériorent la confiance dans les banques actuelle des individus. Le chapitre deux examine l'effet de la confiance dans les banques sur l'inclusion financière. Les individus ayant une plus grande confiance dans les banques sont plus enclins à être inclus financièrement, indépendamment de leurs caractéristiques sociodémographiques, de leur situation financière, de leur pays ou de la période. Le troisième chapitre analyse l'influence de l'inclusion financière sur la satisfaction dans la vie. L'inclusion financière augmente la satisfaction dans la vie des individus, en améliorant leur santé, leur éducation et en leur permettant de créer une entreprise. Le chapitre quatre traite de l'effet du genre des dirigeants des banques sur le crédit des entreprises. Une plus grande proportion de femmes parmi les dirigeants conduit à une réduction de la dette bancaire des entreprises, mais cet effet varie en fonction de la maturité de la dette et n'affecte que les entreprises dirigées par des hommes. Le dernier chapitre se concentre sur l'influence de l'âge des dirigeants des banques sur les prêts durables. Les prêts durables sont moins susceptibles d'être accordés par une banque dont les membres du conseil d'administration et des comités exécutifs sont plus âgés. Dans l'ensemble, cette thèse met en évidence le rôle important des banques dans le développement de la société et l'influence majeure de la société dans le façonnement des pratiques bancaires.

**Mots-clés** : banques • confiance dans les banques • inclusion financière • accès au crédit • prêts durables • genre • satisfaction dans la vie • inflation • âge

## Summary

This dissertation examines the relationship between banking and society. It contributes to a better understanding of how banking affects society and, in turn on how society shapes banking practices. In order to explore this topic, this thesis outlines a total of five independent but thematically related empirical essays. The first chapter studies the impact of inflation on trust in banks. It shows that both recent and mean inflation experienced throughout lifetime hinder individuals' current trust in banks. Chapter two deals with the effect of trust in banks on financial inclusion. Individuals with greater trust in banks are more likely to be financially included, regardless of their socio-demographic characteristics, their financial situation, their country or the time period. The third chapter investigates whether financial inclusion influences life satisfaction. Financial inclusion improves individuals' life satisfaction, by increasing individuals' health, education and through the launch of a business. Chapter four delves into how female bank leadership affects firm credit. Female bank leadership reduces firms' bank debt, but this effect varies with credit maturity and impacts only male-led firms. The final chapter focuses on the influence of bank leaders' age on sustainable lending. Sustainable loans are less likely to be granted by a bank with older bank directors and top executives. Overall, this dissertation highlights the important role of banks in societal development and the major influence of society in shaping banking practices.

**Keywords**: banking • trust in banks • financial inclusion • access to credit • sustainable lending • gender • life satisfaction • inflation • age