UNIVERSITÉ DE STRASBOURG

ÉCOLE DOCTORALE AUGUSTIN COURNOT (ED 221)

Laboratoire de Recherche en Gestion et Economie (UR 2364)

THÈSE présentée par :

Guillaume THÉVENET

soutenue le : **5 décembre 2024**

pour obtenir le grade de : **Docteur de l'université de Strasbourg**

Discipline : Sciences de Gestion

Financial literacy and the entrepreneurial process

The role of formal education

THÈSE dirigée par :

Mme HAMELIN Anaïs	Professeur, Université de Strasbourg

RAPPORTEURS :

Mme BOUAISS Karima	Professeur, Université de Lille
M. SCHMITT Christophe	Professeur, Université de Lorraine

AUTRES MEMBRES DU JURY :

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« A mon grand-père, Serge, pour m'avoir transmis ton amour du savoir »

« L'université de Strasbourg n'entend donner ni approbation ni improbation aux opinions exprimées dans cette thèse. Ces opinions doivent être considérées comme propres à leur auteur »

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Résumé long

Les petites et moyennes entreprises (PME) représentent la majorité des entreprises, au sein de l'économie mondiale comme française. De plus, les PME sont à l'origine en France de près de la moitié de la valeur ajoutée nationale, ce qui souligne leur importance dans l'économie française. Depuis les années 2000, on constate une augmentation du nombre de créations d'entreprises, mais également une augmentation des faillites d'entreprises. Ainsi, le développement de la vocation entrepreneuriale chez les individus doit s'accompagner d'une formation leur permettant de réussir dans leurs projets entrepreneuriaux.

Dans cette optique, l'éducation financière apparaît comme un type d'éducation de premier choix, à développer chez les entrepreneurs. Pour quantifier cette éducation financière, une très large partie de la littérature utilise la notion de littératie financière. La littératie financière se définit comme la compréhension des individus relative à des concepts financiers basiques. On peut identifier trois concepts clef : la compréhension du fonctionnement des intérêts composés, la compréhension du fonctionnement du mécanisme de l'inflation et la compréhension des notions de risque et de diversification des risques.

La littérature reliant la littératie financière à l'entrepreneuriat reste naissante. Certaines études établissent une relation entre la littératie financière et le développement des compétences entrepreneuriales, tandis que d'autres montrent une relation négative entre la littératie financière des entrepreneurs et l'accès au financement. Le but de cette thèse est de contribuer à cette littérature, en répondant à deux questions :

- **Quels sont les effets de la littératie financière sur les différentes étapes du processus entrepreneurial ?**

Dans un premier chapitre, nous nous intéressons à une étape du processus entrepreneurial située en amont de la création effective de l'entreprise : l'intention entrepreneuriale. L'intention entrepreneuriale se définit comme la volonté planifiée et intentionnelle d'un individu de créer son entreprise. Il s'agit donc de l'une des premières étapes du processus entrepreneurial. Dans ce chapitre, nous étudions comment la littératie financière peut influencer l'intention entrepreneuriale des individus. Nous supposons que la littératie financière des individus peut les amener à estimer leur chance de réussite en entrepreneuriat

11

comme plus élevée, car la littératie financière fait partie des connaissances utiles aux entrepreneurs. En revanche, une littératie financière plus élevée peut permettre aux individus d'avoir une meilleure compréhension des risques liés aux activités entrepreneuriales, et donc limiter leur intention de créer une entreprise. Pour étudier la relation entre la littératie financière, réelle ou perçue, et l'intention entrepreneuriale des individus, nous utilisons les réponses données à un questionnaire que nous avons réalisé. Ce questionnaire s'adresse à l'ensemble des étudiants de l'Université de Strasbourg, et a collecté 11 227 réponses entre octobre et décembre 2021. Pour ce chapitre, nous utilisons 8 274 réponses individuelles, représentatives des étudiants de l'Université de Strasbourg. L'analyse de ces réponses nous permet d'observer que la littératie financière a un effet positif sur l'intention entrepreneuriale des étudiants.

Dans le second chapitre de la thèse, nous nous intéressons à une deuxième étape du processus entrepreneurial située en aval de la création effective de l'entreprise. En effet, après avoir montré dans un premier chapitre l'importance de la littératie financière dans la construction de l'intention entrepreneuriale, il nous semblait nécessaire d'étudier les effets de la littératie financière sur le quotidien des PME. La question de l'accès au financement des PME est un sujet qui a fait l'objet de nombreuses investigations, tant sur le plan théorique qu'empirique. Ce chapitre s'inscrit donc dans une longue littérature qui, partant des théories traditionnelles de la structure de capital des entreprises, s'est intéressée aux déterminants éducationnels de la structure de capital des PME.

Dans ce chapitre, nous étudions comment chaque dimension de la littératie financière des individus peut influencer la structure de capital des PME et le niveau de trésorerie des PME. Nous utilisons pour ce second chapitre un échantillon de PME françaises. Nous avons transmis un questionnaire à leurs dirigeants, mesurant notamment leur niveau de littératie financière en évaluant leur compréhension du fonctionnement des intérêts composés, du mécanisme de l'inflation et leur compréhension des notions de risque et de diversification des risques. Nous avons croisé ces informations avec les données financières des PME en utilisant la base de données AMADEUS du Bureau Van Dijk. Nos résultats montrent qu'une seule dimension de la littératie financière, la compréhension du fonctionnement des intérêts composés, a un effet sur le niveau de levier à long terme des PME. Ainsi, ce chapitre met en valeur l'intérêt théorique et empirique, de considérer chaque dimension de la littératie financière comme un déterminant individuel de la structure de capital des PME.

- **Où développer la littératie financière ?**

Ce troisième chapitre étudie l'effet de chaque faculté d'étude sur le niveau de littératie financière des étudiants. Cette question est d'un intérêt premier car les études portant sur ce sujet s'inscrivent dans un contexte anglo-saxon, qui permet une plus grande interdisciplinarité que le modèle français des facultés. Parce qu'elles développent des compétences variées, nous supposons que les différentes facultés ont des effets différents sur les dimensions de la littératie financière. Ainsi, les facultés qui développent plus particulièrement les compétences mathématiques telles que les facultés de sciences expérimentales ou exactes, pourraient par la même occasion aider leurs élèves à mieux comprendre le fonctionnement des intérêts composés. En effet, cette dimension de la littératie financière est particulièrement reliée à la capacité des individus à manipuler des outils mathématiques. À l'inverse, les facultés précitées sont moins enclines à développer la compréhension du risque et de la diversification du risque, qui n'est pas liée aux outils mathématiques. De plus, nous étudions également comment les différentes facultés d'étude influencent la perception qu'ont leurs élèves de leur niveau de littératie financière.

Nous utilisons comme base de données celle constituée pour les besoins du chapitre 1, qui regroupe les réponses de 11 227 étudiants de l'Université de Strasbourg. Pour ce chapitre, nous utilisons 7 121 réponses. Nos résultats montrent sans surprise que les étudiants en économie et gestion sont les plus performants en matière de littératie financière, les étudiants en humanités étant les plus en difficulté. Nos résultats confirment que chaque faculté peut développer des points spécifiques de la littératie financière des individus, car les étudiants en sciences expérimentales et exactes sont performants sur la compréhension des intérêts composés. Nous avons également identifié les étudiants en sciences de la vie comme étant sujets à un biais de sous-confiance dans leur littératie financière. Enfin, nous montrons que la faculté d'étude est le second facteur le plus important déterminant la littératie financière des étudiants, ce qui souligne le rôle important que joue l'université dans la formation des futurs entrepreneurs français.

Table des matières

Liste des tableaux

Introduction générale

Depuis 2000, on constate en France une augmentation du nombre de créations d'entreprises. Ainsi, pour 574 500 entreprises créées en 2015, on constate 1 051 500 créations d'entreprises en 2023[1], soit une augmentation de 83 %. Après avoir connu une forte baisse de 2015 à 2021, le nombre de défaillances d'entreprises est très rapidement remonté, pour atteindre 56 000 défaillances en 2023[2]. Un rapport de la Banque de France (Gonzalez, 2023) met en exergue le fait que, bien qu'une partie conséquente des récentes défaillances d'entreprises soit imputable aux retombées de la crise sanitaire de 2020-2021, les défaillances d'entreprises sont aussi le fait de mauvaises décisions de la part des entrepreneurs. Au niveau européen, bien que le nombre de créations d'entreprises reste stable le nombre de défaillances d'entreprise explose en 2024[3].

Les PME (petites et moyennes entreprises) sont un acteur majeur de nos économies. Dans l'Union européenne (UE), les PME représentent plus de 99 % des entreprises et contribuent à environ deux tiers de l'emploi total (Katsinis et al., 2024). Selon le rapport annuel 2023 de la Commission européenne sur les PME européennes (Di Bella et al., 2023), elles représentent environ 56,4 % du PIB de l'UE. Ces chiffres soulignent le rôle vital des PME dans le maintien de l'activité économique en Europe. En France, les PME représentent 99 % des entreprises françaises, et presque 42 % de la valeur ajoutée[4]. Si l'on exclut les microentreprises, les PME françaises représentent 29 % des emplois français et 23 % de la valeur ajoutée[7]. Les faillites de PME représentent en 2021 en France, une menace pour 171 305 emplois, en excluant les faillites de micro-entreprises (Gonzalez, 2023). Favoriser la création et la survie des PME est donc un enjeu majeur pour les pouvoirs publics.

Ainsi, l'Etat a proposé une large variété d'aides à destination des PME pour faciliter leur création et leur survie. Crée en 1977, l'Aide à la Création et à la Reprise d'Entreprise est spécifiquement dédiée à aider les entrepreneurs à commencer leur projet entrepreneurial. En

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[1] https://www.insee.fr/fr/outil-interactif/5367857/tableau/60_ETP/1.61_DCE

[2] https://www.insee.fr/fr/outil-interactif/5367857/tableau/60_ETP/1.61_DCE

[3] https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240816-2

[4] Source : Insee : https://www.insee.fr/fr/outil-interactif/5367857/tableau/60_ETP/0.62_ENT

plus de cela, l'Aide de Retour à l'Emploi peut être utilisée pour aider les créateurs d'entreprises en situation de chômage à créer leur entreprise. En parallèle de ces aides, des organismes publics comme BPI France, proposent un soutien financier aux entrepreneurs. Par exemple, OSEO[5] proposait depuis 2013 des prêts à taux zéro à destination des PME, pour favoriser leur accès au financement. Aujourd'hui la structure OSEO n'est plus active, mais BPI propose une multitude d'aides à destination des créateurs d'entreprise et des PME déjà établies, dont l'attribution varie en fonction des projets soutenus[6].

Toutefois, la hausse des faillites nous amène à nous questionner sur la capacité qu'ont les entrepreneurs à assurer la pérennité de leurs entreprises. Ainsi, bien que les politiques publiques se traduisent par plus de créations, la question de la viabilité de ces créations d'entreprises reste à étudier. Camerer et Lovallo (1999) ont mis en lumière l'existence d'entrées excessives en entrepreneuriat. Une des raisons invoquées par ces auteurs est la sur-confiance des entrepreneurs, vis-à-vis de leur capacité à réussir. Ainsi, une trop grande part d'individus se lance dans l'aventure entrepreneuriale, pensant avoir les capacités nécessaires pour gérer efficacement leurs entreprises. En définitive, leur capacité à être des entrepreneurs pérennes s'avère limitée, ce qui conduit à la faillite de leurs entreprises. De ce fait, le rôle des pouvoirs publics est certes d'encourager la création d'entreprise, mais aussi de veiller à ce que les entrepreneurs soient en mesure de gérer leurs entreprises efficacement.

Certains pays comme la Belgique mettent donc en place des certifications visant à s'assurer que les futurs entrepreneurs possèdent les connaissances nécessaires pour assurer la bonne gestion de leurs entreprises[7]. Cet embryon de « permis d'entreprendre » marque bien la volonté du pays de limiter les projets entrepreneuriaux voués à l'échec, du fait d'un manque de connaissances de la part des futurs entrepreneurs. En France, le site « Mon Compte Formation[8] » propose un grand nombre de formations destinées aux futurs entrepreneurs et à ceux déjà établis. Ceci traduit la volonté de l'Etat d'augmenter les connaissances des entrepreneurs, afin d'augmenter le nombre de création d'entreprises pérennes.

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[5] https://www.bpifrance.fr/nos-actualites/oseo-filiale-de-la-banque-publique-dinvestissement-lance-un-nouveau-fonds-de-garantie-pour-soutenir-la-tresorerie-des-pme-et-des-tpe

[6] https://bpifrance-creation.fr/moment-de-vie/aides-a-creation-ou-reprise-dentreprise-comment-identifier

[7] https://www.entreprenant.be/comment-devenir-independant-en-belgique/

[8] https://www.moncompteformation.gouv.fr/espace-prive/html/#/formation/recherche

Le rôle des connaissances et de l'éducation des entrepreneurs sur les différentes étapes du processus entrepreneurial a été étudié par une large littérature. Ainsi, l'éducation aide les entrepreneurs à développer leur intention de créer une entreprise (Ahmed et Klobas, 2017 ; Heuer et Kolvereid, 2014 ; Kassean *et al.*, 2015 ; Tsaknis *et al.*, 2022). De plus, l'éducation des entrepreneurs leur permet également un accès facilité au financement externe (Irwin et Scott, 2010).

La question du rôle de l'éducation dans le succès du projet entrepreneurial est à rattacher à un autre pan de la littérature, qui s'est intéressé à l'éducation en tant que déterminant du succès des projets entrepreneuriaux. D'après la théorie du management par les ressources, les entreprises se démarquent de leurs concurrents grâce à un ensemble de facteurs stratégiques, qui lui permettent d'obtenir un avantage concurrentiel (Barney, 1991). La théorie du capital humain (Becker, 1964) met en lumière l'importance des connaissances, particulièrement les connaissances spécifiques, des entrepreneurs en tant que ressource stratégique pour une entreprise. Ainsi, l'éducation des entrepreneurs est supposée avoir une influence positive sur la survie et le développement des entreprises. Alors que les recherches empiriques ont d'abord montré un lien positif entre l'éducation des entrepreneurs et la performance de leurs entreprises (Unger et al., 2011), Martin et al. (2013) ont souligné l'instabilité qui existait dans les résultats des études portant sur ce sujet. Ainsi, comprendre comment l'éducation des entrepreneurs peut influencer le bon déroulement de leur projet entrepreneurial reste une question d'intérêt.

Cette question est au cœur du débat actuel portant sur la nécessité de repenser l'éducation entrepreneuriale. Hägg et Gabrielsson (2019) suggèrent qu'une des questions d'intérêt est : que devons-nous enseigner ? Ainsi, le contenu des cours entrepreneuriaux doit être repensé, de façon à pourvoir aux entrepreneurs des connaissances qui leur seront utiles à différentes étapes de leur projet entrepreneurial. Pour aller plus loin, il est nécessaire que l'éducation entrepreneuriale encourage les individus à devenir entrepreneurs, tout en s'assurant que ces futurs entrepreneurs seront à même de réussir leur projet.

Dans cette optique, l'éducation financière apparaît comme un type d'éducation de premier choix, à développer chez les entrepreneurs. Pour quantifier cette éducation financière, une très large partie de la littérature utilise la notion de littératie financière. La littératie financière se définit comme la compréhension des individus relative à des concepts financiers basiques (Lusardi et Mitchell, 2008). On peut identifier trois concepts clef : la compréhension du fonctionnement des intérêts composés, la compréhension du fonctionnement du mécanisme

de l'inflation et la compréhension des notions de risque et de diversification des risques. Le concept de littératie financière a été principalement utilisé dans la littérature s'intéressant aux comportements financiers et au bien-être financier des ménages.

La littératie financière a de nombreux effets positifs sur les individus, parmi lesquels une meilleure inclusion financière (Grohman et al., 2018), un bien-être financier plus élevé (Lee et al., 2019) et la prise de décisions financières plus performantes. Ainsi, les individus avec une littératie financière plus élevée tendent à mieux planifier leur retraite (Lusardi et Mitchell, 2014), à investir plus souvent et efficacement sur les marchés financiers (Van Roiij et al., 2011) et à prendre des décisions d'investissement plus éclairées (Allgood et Walstad, 2016). Plusieurs études montrent qu'un faible niveau de littératie financière est souvent corrélé à des comportements financiers sous-optimaux, tels que l'absence d'épargne ou une accumulation excessive de dettes à taux d'intérêt élevé (Goyal et Kumar, 2021).

Ainsi, on constate que la littératie financière produit chez les individus à la fois une plus grande participation aux activités financières et permet aux individus d'avoir une gestion financière plus performante. Elle répond donc chez les ménages à la double nécessité (développement de l'intention et de la performance) à laquelle l'éducation entrepreneuriale doit répondre. On peut donc s'attendre à ce que cette connaissance soit développée chez les entrepreneurs.

On remarque pourtant qu'en France, les entrepreneurs souffrent d'un manque de littératie financière, un problème identifié par le réseau national Crésus[9]. Une part grandissante des créateurs d'entreprise se lance dans l'aventure entrepreneuriale en ne considérant pas les compétences financières exigées pour réussir à créer et à pérenniser leurs entreprises. Ce phénomène avait déjà été documenté par Wise (2013) qui montrait le faible niveau de connaissance financière des entrepreneurs au niveau mondial. De plus, Wise (2013) montrait que ces faibles connaissances financières avaient un impact négatif sur les chances de survie des entreprises. Des entretiens avec des bénévoles du Réseau Crésus nous ont révélé que dans leurs interactions avec les entrepreneurs qu'ils rencontraient, la plupart ne savaient pas ce qu'était un business plan, ou bien ne comprenaient pas l'importance d'établir des rapports financiers et comptables. En-dehors des actions menées par le Réseau Crésus et de quelques

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[9] https://www.cresus.org/

initiatives, le développement de l'éducation financière des entrepreneurs reste un sujet peu développé dans les politiques publiques.

La littérature reliant la littératie financière à l'entrepreneuriat reste naissante. Certaines études établissent une relation entre la littératie financière et le développement des compétences entrepreneuriales (Brixiova et al., 2020, Drexler et al., 2014), tandis que d'autres montrent une relation négative entre la littératie financière des entrepreneurs et l'accès au financement externe (Basha et al., 2023). Le but de cette thèse est de contribuer à cette littérature, en répondant à deux questions :

Quels sont les effets de la littératie financière sur les différentes étapes du processus entrepreneurial ?

L'intérêt de cette question réside dans la nécessité pour l'éducation entrepreneuriale d'identifier des connaissances, qui accompagneront l'entrepreneur tout au long de son parcours, et qui sont possibles à développer chez les entrepreneurs. Certains facteurs responsables des difficultés liées à la création et à la survie des entreprises comme l'âge ou le genre des entrepreneurs sont très difficilement atteignables pour les pouvoirs publics. De même, le niveau d'éducation général des entrepreneurs français est assez élevé, 37,8 % d'entre eux ayant au minimum un Bac+4[10]. Il semble donc que l'éducation générale des entrepreneurs français ne soit pas un levier disponible pour améliorer le bien-être de leurs entreprises. En revanche, des initiatives telles que la Global Money Week[11] prouvent qu'il est possible d'améliorer rapidement la littératie financière des individus, avec des bénéfices observables à court, moyen et long terme. De ce fait, identifier la littératie financière comme un moyen d'accompagner les entrepreneurs tout au long de leur projet entrepreneurial apparaît comme encore plus intéressant pour les pouvoirs publics. Pour ce faire, nous étudions dans une première partie les effets de la littératie financière sur deux étapes du processus entrepreneurial, situées de part et d'autre de l'étape de la création effective de l'entreprise. Dans un premier chapitre, nous étudions la relation entre la littératie financière des individus et leur intention entrepreneuriale. Nous cherchons ici à comprendre si la littératie financière est un contenu de l'éducation entrepreneuriale pouvant servir à développer le nombre de créations d'entreprises. Dans un second chapitre, nous étudions comment la littératie financière influence la structure de capital

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[10] https://www.insee.fr/fr/statistiques/2015210#graphique-figure1

[11] https://globalmoneyweek.org/

des entreprises déjà créées. Le but dans ce second chapitre est de comprendre si la littératie financière, en tant que contenu de l'éducation entrepreneuriale, permet aux entrepreneurs d'accéder à des ressources supplémentaires, pour soutenir le développement de leurs entreprises.

Où développer la littératie financière ?

Ici, nous contribuons à répondre à une seconde question posée par Hägg et Gabrielsson (2019) : à qui sont destinés les programmes d'éducation entrepreneuriale ? À travers cette question, les auteurs identifient deux cibles des programmes d'éducation entrepreneuriale. D'abord, les étudiants spécialisés en entrepreneuriat sont ceux dont l'intention entrepreneuriale est déjà formée ou en cours de formation. Ces étudiants sont à la recherche de connaissances poussées qui leur permettront de mener à bien leur projet entrepreneurial. On peut donner l'exemple des pôles PÉPITE (Pôle Étudiant Pour l'Innovation, le Transfert et l'Entrepreneuriat)[12] qui permettent aux étudiants-entrepreneurs de bénéficier de conseils d'experts, de mentors financiers et d'accès à des ressources pour développer leurs compétences en matière de gestion d'entreprise et de finances. L'Université s'adresse dans ce cadre à des étudiants spécialisés, avec un projet entrepreneurial développé. La deuxième cible identifiée par Hägg et Gabrielsson (2019) est la population étudiante générale, qui n'est pas engagée dans un processus entrepreneurial. L'objectif pour cette cible de l'éducation entrepreneuriale est moins de s'assurer de la réussite d'un projet, que de développer une culture générale de l'entrepreneuriat. Pour les étudiants, de manière générale, l'éducation entrepreneuriale doit leur permettre de comprendre les bases de l'entrepreneuriat, dans l'hypothèse où ils choisiraient cette voie. Hägg et Gabrielsson (2019) suggèrent que les recherches futures ont intérêt à se questionner sur les besoins éducationnels rencontrés par les étudiants, dans le cadre de l'éducation entrepreneuriale.

Nous contribuons à répondre à cette question, en nous interrogeant sur les besoins en littératie financière des étudiants des différentes facultés composant une université française. Le système universitaire français repose traditionnellement sur une structure disciplinaire rigide, avec des facultés et des filières spécialisées (sciences, lettres, droit, gestion, etc.). Cette organisation, bien qu'efficace pour offrir une expertise poussée dans un domaine donné, peut

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[12] https://www.pepite-france.fr/

créer des silos qui empêchent les étudiants d'acquérir des compétences transversales, telles que la littératie financière. En effet, les étudiants en sciences humaines ou en arts, par exemple, ont peu ou pas accès à des cours sur la gestion financière ou l'économie, et sont donc moins armés pour réussir leurs potentiels projets entrepreneuriaux. De plus, les programmes pluridisciplinaires, qui pourraient pallier ce problème, sont encore peu développés en France par rapport à d'autres systèmes universitaires. Par exemple, dans les universités anglo-saxonnes, il est courant d'offrir des cours optionnels ou des modules interdisciplinaires en finances personnelles ou en entrepreneuriat à tous les étudiants, indépendamment de leur cursus (Hägg et Gabrielsson, 2019). Ainsi, notre objectif dans ce troisième chapitre est d'identifier, au sein de la population générale des étudiants, les sous-populations les plus fragiles à qui il est prioritaire de s'adresser.

Organisation de la thèse

Premier Chapitre

Dans un premier chapitre, nous nous intéressons à une étape du processus entrepreneurial située en amont de la création effective de l'entreprise : l'intention entrepreneuriale. L'intention entrepreneuriale se définit comme la volonté planifiée et intentionnelle d'un individu de créer son entreprise (Krueger et al., 2000). Il s'agit donc de l'une des premières étapes du processus entrepreneurial. Nous utilisons comme cadre théorique de ce premier chapitre la théorie du comportement planifié d'Ajzen (1991), particulièrement le concept de contrôle comportemental. Il se définit comme la capacité, réelle et perçue, de l'individu à réussir dans l'activité entrepreneuriale. La théorie du comportement planifié souligne que le contrôle comportemental perçu doit s'articuler avec le contrôle comportemental réel de l'individu, soit la capacité réelle de l'individu à réussir dans le comportement envisagé. Dans le cadre de l'entrepreneuriat, cela peut se traduire par l'idée qu'il ne suffit pas de penser avoir les capacités d'être entrepreneur pour vouloir le devenir, mais également d'avoir objectivement ces capacités.

Pour cette raison, la théorie du comportement planifié semble le cadre théorique le plus adapté à l'étude de la relation entre la littératie financière des individus et leur intention entrepreneuriale. En effet, la littératie financière est à la fois définie comme un ensemble de

connaissances objectives vis-à-vis de concepts financiers de base (Lusardi et Mitchell, 2008), mais aussi comme la perception qu'ont les individus de leurs propres connaissances financières (Allgood et Walstad, 2016). Ce caractère dual de la littératie financière semble donc s'adapter à la définition du contrôle comportemental.

Dans ce premier chapitre, notre objectif est de contribuer à répondre à la question posée par Hägg et Gabrielsson (2019) : que devons-nous enseigner aux entrepreneurs ? En effet, les effets de l'éducation entrepreneuriale sur l'intention entrepreneuriale ont fait l'objet de nombreuses études (Ahmed et Klobas, 2017 ; Cho, 1998 ; Donckels, 1991 ; Gorman et al., 1997 ; Heuer et Kolvereid, 2014 ; Kassean et al., 2015 ; Kuratko, 2003 ; McMullan et al., 2002 ; Peterman et Kennedy, 2003 ; Tsaknis et al., 2022 ; Wu et Wu, 2008), mais la question du contenu reste à approfondir. L'étude de Kassean et al. (2015) a montré que le contenu des cours d'entrepreneuriat pouvait avoir un effet réducteur sur l'intention entrepreneuriale. À l'inverse, Ahmed et Klobas (2017) notent une relation positive entre cours d'entrepreneuriat et intention entrepreneuriale. Le but de ce chapitre est donc d'étudier l'effet de la littératie financière sur l'intention entrepreneuriale, en tant que contenu inexploré. Pour ce faire, nous développons une série d'hypothèses basées sur la théorie du comportement planifié, plus particulièrement autour du concept de contrôle comportemental. Nous supposons que la littératie financière objective, mesurée, peut influencer le contrôle comportemental réel des individus et ainsi augmenter leur intention entrepreneuriale. Ensuite, nous supposons que la littératie financière subjective (perçue) des individus influence leur contrôle comportemental perçu à la hausse, résultant en une intention entrepreneuriale plus importante. Pour étudier la relation entre la littératie financière, réelle ou perçue, et l'intention entrepreneuriale des individus, nous utilisons les réponses données à un questionnaire que nous avons réalisé. Ce questionnaire s'adresse à l'ensemble des étudiants de l'Université de Strasbourg, et a collecté 11 227 réponses entre octobre et décembre 2021. Pour ce chapitre, nous utilisons 8 274 réponses individuelles, représentatives des étudiants de l'Université de Strasbourg. L'analyse de ces réponses nous permet d'observer que la littératie financière objective a un effet direct positif sur l'intention entrepreneuriale des étudiants, tout comme la littératie financière subjective (perçue).

Les contributions de ce chapitre à la littérature sont multiples. D'abord, par le biais de la littératie financière objective, nous disposons d'une mesure capable d'identifier le contrôle comportemental objectif des individus, vis-à-vis de l'entrepreneuriat. Les études existantes se concentrent sur le contrôle comportemental perçu, du fait de la difficulté de mesurer le contrôle

comportemental objectif (Ajzen, 2006). De ce fait, nous contribuons à la littérature portant sur l'intention entrepreneuriale des individus, en identifiant la littératie financière objective, soit le niveau de connaissance financière objectif des individus, comme un nouveau déterminant de leur intention entrepreneuriale. De la même manière, nous mettons en lumière l'effet de la littératie financière perçue sur l'intention entrepreneuriale. Enfin, nous contribuons à la littérature s'intéressant à l'éducation entrepreneuriale. En identifiant la littératie financière des individus comme un déterminant de leur intention entrepreneuriale, nous participons à répondre à la question de Hägg et Gabrielsson (2019) : que devons-nous enseigner aux entrepreneurs ? La réponse à cette question peut donc intéresser les pouvoirs publics : si l'un de leurs objectifs est d'encourager la création d'entreprises, un moyen à leur disposition est d'augmenter la littératie financière des individus, qui verront leur intention entrepreneuriale positivement affectée.

Second Chapitre

Dans ce second chapitre de la thèse, nous nous intéressons à une deuxième étape du processus entrepreneurial située en aval de la création effective de l'entreprise. En effet, après avoir montré dans un premier chapitre l'importance de la littératie financière dans la construction de l'intention entrepreneuriale, il nous semblait nécessaire d'étudier les effets de la littératie financière sur le quotidien des PME. La question de l'accès au financement des PME est un sujet qui a fait l'objet de nombreuses investigations, tant sur le plan théorique qu'empirique (Kumar et al., 2020). Ce chapitre s'inscrit donc dans une longue littérature qui, partant des théories traditionnelles de la structure de capital des entreprises, s'est intéressée aux déterminants éducationnels de la structure de capital des PME.

En l'état actuel de la littérature, l'effet des connaissances financières des entrepreneurs sur la structure de capital de leurs entreprises reste peu étudié. La plupart des études se concentrent sur les pratiques financières des entrepreneurs (Addo et Asante, 2022 ; Buchdadi et al., 2020 ; Frimpong et al., 2022 ; Hussain et al., 2018 ; Korutaro et al., 2013 ; Okello et al., 2017) et montrent une relation positive entre le développement des pratiques financières et l'accès au financement externe des PME. Cette littérature naissante considère que la littératie financière des entrepreneurs peut être confondue avec leurs pratiques financières. Cependant, Mitchell et Lusardi (2015) et Lusardi et Mitchell (2023) opèrent une distinction entre pratiques financières et littératie financière des individus. La littératie financière est à l'origine des

pratiques financières. De plus, Mitchell et Lusardi (2015) démontrent que pour mesurer la littératie financière des individus, la méthode la plus robuste consiste à utiliser les instruments développés par Lusardi et Mitchell (2008), ce qui est peu fait dans la littérature entrepreneuriale.

Seule l'étude menée par Basha et al. (2023) étudie le lien direct entre la littératie financière des entrepreneurs et la structure de capital des PME, via leur niveau d'endettement. Cette étude se situe à un niveau international et utilise des scores moyens de littératie financière par pays. Or, Mitchell et Lusardi (2015) démontrent que l'utilisation de scores agrégés de littératie financière ne permet pas d'obtenir des résultats stables. De plus, Lusardi et Mitchell (2008) définissent les différentes dimensions de la littératie financière comme des concepts indépendants. En effet, la mesure de chaque dimension de la littératie financière implique des compétences particulières. Par exemple, la compréhension du fonctionnement des taux d'intérêt composés est liée à la numératie des individus (Lusardi et Mitchell, 2008) qui se définit comme la capacité des individus à manipuler et comprendre les outils mathématiques. La numératie a par ailleurs peu de lien avec une autre dimension de la littératie financière : la capacité à comprendre les notions de risque et de diversification des risques. De ce fait, nous souhaitons répondre dans ce second chapitre à une première limite, théorique, venant de l'article de Bahsa et al. (2023), en utilisant séparément chaque dimension de la littératie financière comme des concepts indépendants. De plus, l'article de Basha et al. (2023) s'appuie sur des scores nationaux de littératie financière. Or, Lusardi et Mitchell (2014) documentent les changements intra-nationaux de littératie financière, pour des populations spécifiques (femmes, jeunes, seniors). Ainsi, nous répondons également à une limite empirique de la littérature en utilisant des données individuelles mesurant la littératie financière d'entrepreneurs. In fine, ce chapitre étudie la relation entre chaque dimension de la littératie financière, le niveau d'endettement et la gestion de trésorerie des PME.

Nous utilisons pour ce second chapitre un échantillon de PME françaises. Nous avons transmis un questionnaire à leurs dirigeants, mesurant notamment leur niveau de littératie financière en utilisant la mesure de Lusardi et Mitchell (2008). Nous avons croisé ces informations avec les données financières des PME en nous servant de la base de données AMADEUS du Bureau Van Dijk. Nos résultats montrent qu'une seule dimension de la littératie financière, la compréhension du fonctionnement des intérêts composés, a un effet sur le niveau de levier à long terme des PME. Nos résultats montrent également que la littératie financière des entrepreneurs n'a aucun effet sur la gestion de leur trésorerie. Ainsi, ce chapitre apporte une

contribution à la littérature étudiant la relation entre la littératie financière et la structure de capital des PME. Basha et al. (2023) identifient plusieurs canaux pouvant expliquer la relation entre la littératie financière et la structure de capital des PME. Nous montrons dans ce chapitre qu'un seul canal permet d'expliquer l'effet de la littératie financière sur le niveau d'endettement des PME : le développement de la préférence pour le long terme et de la capacité à établir un planning à long terme.

Troisième Chapitre

Ce troisième chapitre étudie l'effet de chaque faculté d'étude sur le niveau de littératie financière des étudiants. Cette question est d'un intérêt premier car les études portant sur ce sujet (Chen et Volpe, 1998 ; 2022 ; Sarigül, 2014) s'inscrivent dans un contexte anglo-saxon, qui permet une plus grande interdisciplinarité que le modèle français des facultés. Parce qu'elles développent des compétences différentes, nous supposons que les différentes facultés ont des effets différents sur les dimensions de la littératie financière telle que définie par Lusardi et Mitchell (2008). Ainsi, les facultés qui développent plus particulièrement les compétences mathématiques telles que les facultés de sciences expérimentales ou exactes, pourraient par la même occasion aider leurs élèves à mieux comprendre le fonctionnement des intérêts composés. En effet, cette dimension de la littératie financière est particulièrement reliée à la capacité des individus à manipuler des outils mathématiques (Lusardi et Mitchell, 2008). À l'inverse, les facultés précitées sont moins enclines à développer la compréhension du risque et de la diversification du risque, qui n'est pas liée aux outils mathématiques. De plus, nous étudions également comment les différentes facultés d'étude influencent la perception qu'ont leurs élèves de leur niveau de littératie financière.

Nous utilisons comme base de données celle constituée pour les besoins du chapitre 1, qui regroupe les réponses de 11 227 étudiants de l'Université de Strasbourg. Pour ce chapitre, nous utilisons 7 121 réponses. Nos résultats montrent sans surprise que les étudiants en économie et gestion sont les plus performants en matière de littératie financière, les étudiants en humanités étant les plus en difficulté. Nos résultats confirment que chaque faculté peut développer des points spécifiques de la littératie financière des individus, car les étudiants en sciences expérimentales et exactes sont performants sur la compréhension des intérêts composés. Nous avons également identifié les étudiants en sciences de la vie comme étant sujet à un biais de sous-confiance dans leur littératie financière. Enfin, nous montrons que la faculté

d'étude est le second facteur le plus important déterminant la littératie financière des étudiants, ce qui souligne le rôle important que joue l'université dans la formation des futurs entrepreneurs français.

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Chapter 1: Financial Literacy and Entrepreneurial Intention: An Empirical Study[13]

Abstract

This paper examines the impact of financial literacy on entrepreneurial intention. By integrating the planned behavior theory and financial theory, we propose a conceptual model that breaks down the effect of education on entrepreneurial intention. The objective and subjective dimensions of financial literacy are modeled in order to ascertain their effects on entrepreneurial intention. To investigate this question empirically, we conducted an original survey with 8,274 responses. The results indicate that both objective and subjective financial literacy have a positive influence on entrepreneurial intention. Our findings indicate that objective knowledge is also a significant determinant of entrepreneurial intention.

Keywords - entrepreneurial intention; theory of planned behavior; behavioral control; financial literacy

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[13] Ce chapitre a été co-écrit avec Anaïs Hamelin

1. Introduction

In recent years, entrepreneurship is increasingly considered a career choice by younger generations (Edelman *et al.*, 2016; Gieure *et al.*, 2019). The creation of a new venture is often viewed as an intentional, planned behavior (Krueger, 1993; Krueger *et al.*, 2000). Entrepreneurial intention is a major determinant of actual entrepreneurial behaviors (Neneh, 2019). Thus, entrepreneurial intentions have been studied extensively (Bird, 1988; Carr and Sequeira, 2007; Gieure *et al.*, 2019; Kolvereid, 1996; Krueger, 1993; Krueger and Carsrud, 1993; Heuer and Kolvereid, 2014; Hsu *et al.*, 2019; Meoli *et al.*, 2020; Nowinski and Haddoud, 2019). Studies have investigated several individual determinants of entrepreneurial intention, among which entrepreneurial education plays a major role (Ahmed and Klobas, 2017; Cho, 1998; Donckels, 1991; Gorman *et al.*, 1997; Heuer and Kolvereid, 2014; Kassean *et al.*, 2015; Kuratko, 2003; McMullan *et al.*, 2002; Peterman and Kennedy, 2003; Tsaknis *et al.*, 2022; Wu and Wu, 2008). However, Hägg and Gabrielsson (2019) highlighted that one challenge remains unaddressed: the "what to teach?" question. Instructors in entrepreneurial education have to investigate what type of knowledge should be part of entrepreneurial education programs, including meaningful content for fostering people's entrepreneurial intention. Struckell *et al.* (2022) highlight that financial literacy is related to the self-employment of individuals. Although studies establish a relationship between financial literacy and entrepreneurial intention and behaviors (Anshika and Singla, 2022; Li and Qian,2020), the effects of financial literacy on entrepreneurial intention remain unclear. Rostamkalaei et al. (2019) and Nitani et al. (2019) for instance do not observe a positive effect of financial knowledge on self-employment of individuals. There is thus an ongoing debate in the literature discussing the role of financial literacy in shaping individuals' entrepreneurial intention. Most studies within the entrepreneurial research field investigate how financial literacy influences entrepreneurs' financial behaviors, financial attitudes, and SMEs' performance (Grana-Alvarez et al., 2022. Furthermore, Grana-Alvarez et al. (2022) argue that the conceptualization of financial literacy in the context of SME is under-researched. Furthermore, the authors argue that future research has to extend the evidence of the effects of financial literacy on SMEs' lifecycles. Financial literacy is the level of knowledge of individuals regarding baseline financial concepts (Lusardi and Mitchell, 2008; 2014): the understanding of the working of compound interests, how inflation works, and what risk and risk diversification are. In the present study, we investigate

financial literacy as a useful, but understudied, content for entrepreneurial education programs and explore its relationship with the entrepreneurial intention of individuals.

On the basis of the theory of planned behavior (Ajzen, 1991), we identify two channels explaining how financial literacy might influence entrepreneurial intention. The first is the channel of actual behavioral control. Ajzen (1991) defines actual behavioral control as the opportunities, abilities, and skills that individuals have regarding the performance of a given behavior. The higher the actual behavioral control of individuals, the higher their chances of success in performing the behavior. An individual with high actual behavioral control of entrepreneurship has a higher intention to start a business. By improving entrepreneurial skills, objective (i.e. actual) financial literacy might be a part of individuals' actual behavioral control of entrepreneurship, leading them to have a higher entrepreneurial intention. Second is the channel of perceived behavioral control. Perceived behavioral control was introduced by Ajzen (1991) as another antecedent of intention. Perceived behavioral control is defined as a "person's perception of the ease or difficulty of performing the behavior of interest" (Ajzen, 1991). Newman *et al.* (2019) in a meta-analysis observe that individuals' perceived capability to perform entrepreneurial tasks is related to higher entrepreneurial intention. According to the author, entrepreneurial intention is the most studied outcome of perceived capability. Within the entrepreneurial context, McGee *et al.* (2009) show that entrepreneurs' perception of their financial knowledge is related to their broader perception of their ability to succeed in entrepreneurship. Individuals' perception regarding their financial knowledge is defined in the literature as subjective financial literacy (Allgood and Walstad, 2016). In this study, we suggest that subjective financial literacy is part of the perceived chances to succeed in entrepreneurship (i.e. the perceived behavioral control on entrepreneurship). Thus, we suggest that subjective financial literacy is a part of the individuals' perceived behavioral control on entrepreneurship, ultimately positively influencing their entrepreneurial intention. Finally, Ajzen (1991) suggested that individuals with higher objective knowledge and skills (actual behavioral control) regarding a given behavior are more prone to display higher confidence in their chances of success for the behavior (perceived behavioral control). This results in a higher intention to engage in the behavior. The theory of planned behavior thus suggests that the effect of actual behavioral control on intention is partially mediated by perceived behavioral control. However, to our knowledge, this theoretical development has not been confirmed in empirical studies, partly due to the difficulty of capturing individuals' actual behavioral control (Ajzen, 2006). In

this study, we investigate whether subjective financial literacy mediates the relationship between objective financial literacy and entrepreneurial intention.

While the theory of planned behavior considers entrepreneurship as a career choice (Meoli *et al.*, 2020), another stream of literature considers entrepreneurship as an investment decision, where current and future entrepreneurs decide to allocate their wealth to a single company they own (Astebro, 2017; Astebro *et al.*, 2014; Kim *et al.*, 2006; Moskowitz and Vissing-Jørgensen, 2002). Empirically, individuals who become entrepreneurs do not ask for returns proportional to the risk they bear, which is high due to the under-diversification of their assets' portfolio and the risk inherent to entrepreneurial activities (Moskowitz and Vissing-Jørgensen, 2002; Ødegaard, 2009). Such a puzzle is not explained by specific preferences for the risk of entrepreneurs (Astebro *et al.*, 2014). Moskowitz and Vissing-Jørgensen (2002) suggest that entrepreneurs' misperception of risks explains the low risk-return tradeoff of entrepreneurs' asset portfolios. Individuals with higher financial literacy develop financial practices that account more accurately for risk, notably in terms of financial planning (Lusardi and Mitchell, 2007a, 2007b; Stango and Zinmann, 2008; Van Rooij *et al.*, 2012). Therefore, we suggest that a financially literate individual might also better perceive the risks related to entrepreneurship. In that sense, financial literacy may limit people's entrepreneurial intention.

This article proposes an empirical investigation of the relationship between financial literacy and entrepreneurial intention. The first three hypotheses suggest that the relationship is positive, whereas the fourth hypothesis assumes a negative relationship. We test our hypotheses by using 8,274 valid responses to an original survey assessing entrepreneurial intention and financial literacy among university students. We analyze the data by using probit models and a causal mediation analysis. The results reveal that both objective and subjective financial literacy positively and directly affect individuals' entrepreneurial intention. We measure objective financial literacy across three dimensions: the understanding of how compound interests work, how inflation works, and risk and risk diversification. Among those, only the understanding of risk and risk diversification positively influences students' entrepreneurial intention. Moreover, subjective financial literacy positively mediates the relationship between objective financial literacy and entrepreneurial intention. Robustness tests confirm that our results are unaffected by selection bias or reverse causality.

This study makes a significant contribution to the field of entrepreneurial intention literature. The concept of perceived behavioral control (Ajzen, 1991) is a key theoretical

construct in research on entrepreneurial intention (Maheswari *et al.*, 2022; Meoli *et al.*, 2020). Nevertheless, the theory of planned behavior (Ajzen, 1991) posits that alongside perceived behavioral control, actual behavioral control is also a determining factor in individuals' entrepreneurial intentions. The existing literature on entrepreneurial intention does not consider the potential impact of actual behavioral control. By integrating the planned behavior theory and financial theory, we propose a conceptual model that breaks down the effect of education on entrepreneurial intention. The objective and subjective dimensions of financial literacy are modeled in order to ascertain their effects on entrepreneurial intention. This study contributes to the existing literature on entrepreneurial intention by demonstrating that objective knowledge is also a significant factor influencing this construct. Furthermore, we identify a new, unexplored, determinant of entrepreneurial intention: financial literacy. Moreover, we provide empirical evidence that the effect of actual behavioral control on intention is partially mediated by perceived behavioral control. This mediating effect was developed theoretically by Ajzen (1991) but has not been empirically tested in the literature on entrepreneurial intention.

Secondly, our work contributes to the body of knowledge in the field of entrepreneurial education. While a substantial body of research indicates that education has a positive effect on the entrepreneurial intention of individuals (Ahmed and Klobas, 2017), some research suggests that specific types of education may have the opposite effect, reducing people's intention to become entrepreneurs (Kassean *et al.*, 2015). By examining financial literacy as a hitherto under-researched aspect of specific education, we demonstrate that individuals' baseline financial knowledge is positively correlated with their entrepreneurial intention. Consequently, we contribute to the resolution of Hägg and Gabrielsson's (2019) query: The question of what should be taught in entrepreneurial education programs is a key one.

In addition to contributing to the entrepreneurial education literature, this study also contributes to the entrepreneurial literacy literature. A recent stream of literature uses the concept of entrepreneurial literacy to define all the skills and knowledge that relate to entrepreneurial behaviors. As entrepreneurship demands a large range of skills and knowledge, the definition of entrepreneurial literacy is broad. Results in this study suggest that financial literacy and more generally financial knowledge are a part of entrepreneurial literacy. Since the literature on entrepreneurial literacy remains recent, we participate in setting the boundaries of this concept.

Finally, our work has practical contributions for entrepreneurial education instructors. This study highlights the importance of developing risk and risk diversification understanding alongside fostering individuals' perceived financial literacy to foster people's entrepreneurial intention.

2. Literature Review

In the following section, we develop hypotheses based on two theoretical frameworks. First, on the basis of the theory of planned behavior and the inherent concepts of actual and perceived behavioral control, we suggest that objective and subjective financial literacy might increase entrepreneurial intention. Second, on the basis of Moskowitz and Vissing-Jørgensen's (2002) 'private equity premium puzzle', we suggest that financial literacy reduces entrepreneurial intention by improving individuals' ability to perceive risks inherent to entrepreneurship (i.e. a 'back-to-reality effect').

2.1. Theory of planned behavior and financial literacy

According to the theory of planned behavior (Ajzen, 1991), the intention of individuals to perform a behavior is related to the actual behavioral control the individual has on the behavior. The actual behavioral control is the objective ability an individual has to succeed in a given behavior (Ajzen, 1991). Increasing the actual behavioral control over a given behavior leads individuals to have a higher intention to engage in the behavior, as they have more chances to succeed (Ajzen, 1991). According to the theory of planned behavior, the resources (money, time, skills, knowledge, and possibilities to cooperate with others; see Ajzen 1985 for details) and opportunities towards a given behavior increase the actual behavioral control of the individual. We suggest that objective financial literacy might comprise the actual behavioral control of individuals on entrepreneurship. Objective financial literacy can help improve entrepreneurial skills (Drexler *et al.*, 2014), is related to higher business performance (Brixiova *et al.*, 2020; Dahmen and Rodriguez, 2014). Objective financial literacy is associated among entrepreneurs with improved financial practices, such as improved financial management and financial reporting, which improve their access to finance and facilitate business growth (Hussain, 2018). Thus, objective financial literacy is useful knowledge to individuals for starting up their businesses and likely forms a part of their actual behavioral control on

entrepreneurship. Ultimately, financial literacy might enhance the entrepreneurial intention of individuals, since higher actual behavioral control is associated with higher intention (Ajzen, 1991). Therefore, we hypothesize the following:

H1: *Objective financial literacy positively influences entrepreneurial intention.*

The theory of planned behavior states that along with the actual behavioral control, the intention is also influenced by perceived behavioral control, defined as the individual's perception of the ease or difficulty of performing a given behavior (Ajzen, 1991). Perceived behavioral control influences intention by strengthening individuals' confidence in their ability to perform a given behavior (Ajzen, 1991). Individuals with high perceived behavioral control are more likely to persevere and put effort into the given behavior. As they are more confident about their abilities to perform the behavior, their intention is less affected by negative information, emotions, and a lack of opportunities. According to the theory of planned behavior (Ajzen, 1991; Ajzen and Madden, 1986), individuals' thinking about how many opportunities and resources they possess increases perceived behavioral control. For instance, individuals who are convinced about their entrepreneurial abilities have a stronger intention to start a business (Krueger *et al.*, 2000). Numerous studies on entrepreneurial intention have evaluated the relationship between perceived ability and knowledge and entrepreneurial intention. Zhang *et al.* (2015) concluded that perceived behavior control relates significantly to the entrepreneurial intentions of students and that it exerts a greater impact on the intentions than other constructs of the theory of planned behavior. Iglesias-Sánchez *et al.* (2016) reported that perceived behavioral control significantly influences students' intentions to start ventures. Consistently, Karimi *et al.* (2017) also observed the significant impact of perceived behavioral control on Iranian students' entrepreneurial intention. Obschonka *et al.* (2010) distinguish between conditional and unconditional to success entrepreneurial intention and show that individuals perceived entrepreneurial capability positively influences unconditional entrepreneurial intention. Perceived behavioral control is measured using multidimensional scales, asking individuals how confident they are in succeeding in various entrepreneurial activities, similar to the measures of entrepreneurial self-efficacy (Ajzen, 2002; Chen *et al.*, 1998; Zhang *et al.*, 2015), and includes confidence in areas of identifying new business opportunities, creating new products, thinking creatively, and commercializing an idea or new development.

Individuals' education level influences their entrepreneurial intention. Both education in general and entrepreneurship programs in particular positively affect students' entrepreneurial intention. Cho (1998) suggested that education promotes entrepreneurial intention because entrepreneurship-related knowledge and skills stimulate an individual's motivation to create a new venture. Donckels (1991) addressed the promotion of education to encourage entrepreneurial behavior. Gorman *et al.* (1997) and Kuratko (2003) argued that entrepreneurship can be learned or at least encouraged via education. Gorman *et al.* (1997), McMullan *et al.* (2002), and Peterman and Kennedy (2003) indicated that particular entrepreneurship support programs were successful in encouraging entrepreneurs to start a business or to improve their business performance. Wu and Wu (2008) concluded that students who follow entrepreneurship education indeed show a greater intention to start-up. Education enhances the individuals' perceived behavioral control, which positively influences their entrepreneurial intention (Gieure *et al.*, 2019; Heuer and Kolvereid, 2014). Tommy and Pardede (2020) highlight that higher education increases individuals' perception of chances of entrepreneurial success, which defines perceived behavioral control (Ajzen, 1991). The authors show that education is associated with a higher perception of access to entrepreneurial resources and networks. Moreover, Tommy and Pardede (2020) argue that higher education is associated with a higher self-skill awareness. Solesvik (2013) observes that entrepreneurship education positively influences the perceived behavioral control of students, by enhancing their entrepreneurial motivation.

The literature on financial literacy distinguishes between the objective (actual) level and subjective (perceived) level of financial literacy. Subjective financial literacy is the perception individuals have about their level of objective financial literacy (Allgood and Walstad, 2016) and is a strong determinant of individuals' financial behaviors. We suggest that subjective financial literacy influences the individuals' perceived behavioral control on entrepreneurship. McGee *et al.* (2009), highlight that the perception of individuals regarding their ability to financially manage businesses influences the overall perception of individuals regarding their chances of success in starting up businesses. Individuals with higher subjective financial literacy might thus have a stronger belief that they can succeed in entrepreneurship since they have a higher confidence in their financial knowledge. Therefore, we expect that individuals with a higher subjective financial literacy will display a higher level of entrepreneurial intention.

H2: *Subjective financial literacy positively influences entrepreneurial intention.*

Ajzen (1991) demonstrates that while both actual and subjective behavioral controls are drivers of individuals' intentions, enhancing mediation effects between the two forms of behavioral control occur. Ajzen (1991) argues that having effective resources and opportunities for a behavior increases the belief of individuals that they have more chances to succeed in the given behavior. Thus, the effect of actual behavioral control on entrepreneurial intention is also mediated by perceived behavioral control (Ajzen, 1991). Empirical works already indicated the existence of a positive relation between objective and subjective financial literacy (Allgood and Walstad 2016). However, Allgood and Walstad (2016) call to investigate the causal relationship between objective financial literacy and subjective financial literacy, since the authors' empirical setup cannot provide evidence on any causal relationship. On the basis of the theory of planned behavior, we propose that the total effect of objective financial literacy on entrepreneurial intention is partially mediated by subjective financial literacy, and hence is composed of both a direct effect together with an indirect effect (see Figure 1).

H3: *Subjective financial literacy positively mediates the relationship between objective financial literacy and entrepreneurial intention.*

2.2. Entrepreneurs' risk perception and financial literacy

While the theory of planned behavior considers entrepreneurship as a career choice (Meoli *et al.*, 2020), another stream of literature considers entrepreneurship as an investment decision (Astebro, 2017; Astebro *et al.*, 2014; Kim *et al.*, 2006; Moskowitz and Vissing-Jørgensen, 2002). This stream of literature observes that entrepreneurs invest the majority of their wealth in the equity of their firm, resulting in underdiversified assets allocation (Benhabib and Bisin, 2018; Moskowitz and Vissing-Jørgensen, 2002; Hamelin and Pfiffelmann, 2015; Midrigan and Xu, 2014). Therefore, entrepreneurs' portfolios of assets are underdiversified and riskier than assets portfolios of well-diversified diversified investors. Despite this higher exposure to risk, the returns of entrepreneurs' portfolios are similar to the returns of public equity portfolios. Moskowitz and Vissing-Jørgensen (2002) name this situation The private equity premium puzzle and define it: 'If households require such a high expected return to take on the risk of publicly traded equity, why are they willing to invest substantial amounts of wealth in a single private company with a much worse risk-return tradeoff? Should this be

considered a "private equity premium puzzle"?' (Moskowitz and Vissing-Jørgensen 2002, p.747).

Moskowitz and Vissing-Jørgensen (2002) suggest that one explanation of this puzzle is that entrepreneurs and potential entrepreneurs misperceive the risks-return tradeoff attached to entrepreneurial activities. The misperception of risk-return tradeoff leads individuals to invest excessively in entrepreneurship, that is having too highly entrepreneurial intention. We suggest that financial literacy might have a back-to-reality effect on individuals' entrepreneurial intention. Individuals with a higher objective financial literacy might be able to have a more accurate perception of risk–return tradeoffs. With a more accurate perception of risk-return tradeoffs, individuals with high objective financial literacy might consider entrepreneurship less attractive than people with low objective financial literacy. Indeed, more financially literate individuals might be able to understand with more accuracy that returns of entrepreneurial activities do not compensate for the risks undertaken, and thus, financially literate individuals have a greater incentive to diversify their assets in safer markets. More specifically, one aspect of objective financial literacy is the ability of an individual to understand risk and risk diversification (Lusardi and Mitchell,2014). Thus, financial literacy helps individuals invest in diversified portfolios of assets (Lusardi and Mitchell, 2014). Therefore, a more financially literate individual might understand that being an entrepreneur is riskier than investing in a diversified assets portfolio.

Empirical observations show that financial literacy improves individuals' and households' financial decisions (Goyal and Kumar, 2021). Several studies show that financial literacy improves household financial management and risk diversification for households and individuals (Bucher-Koenen and Lusardi, 2011; Klapper *et al.* 2013; Klapper and Panos, 2011; Lusardi and Mitchell, 2007a, 2007b; Lusardi and Tufano, 2015 Van Rooij *et al.*, 2011, 2012). The 'back-to-reality' effect is in line with the previous work within the entrepreneurship literature. Sitkin and Weingart (1995) observe that a more accurate risk perception of entrepreneurs leads to less risky decision-making. Kassean *et al.* (2015) show that entrepreneurial education can have a detrimental effect on attendants' entrepreneurial intention. Attending entrepreneurship courses brings students to have a more accurate, and less optimistic, understanding of entrepreneurship (Osterbeek *et al.*, 2010), and helps students to have a more accurate perception of their chances of success in entrepreneurship (Kassean *et al.*, 2015). Being more realistic about entrepreneurship, students have a lower entrepreneurial intention. Ahmed

and Klobas (2017) highlight that one explanation for the inefficiency of entrepreneurial education programs in fostering entrepreneurial intention is that students in such programs account more for the difficulties of entrepreneurial activities. Von Graevenitz *et al.* (2010) observe that students receiving entrepreneurship education change more quickly and negatively their perception of their entrepreneurial capability. Thus, we suggest that objective financial literacy might enhance students' realism toward entrepreneurship, reducing students' entrepreneurial intention.

H4: *Objective financial literacy negatively influences entrepreneurial intention.*

3. Data and Method

3.1. Research design and sample

To test our hypotheses, we rely on a unique dataset. The data are collected using a survey designed on LimeSurveyV3, administered to the students from the University of Strasbourg. We focused on students as a large part of the literature on entrepreneurial intention and entrepreneurial education has students as the study population (Diaz-Garcia and Jimenez-Moreno, 2010; Hägg and Gabrielsson, 2019; Kickul *et al.*, 2008; Laviolette *et al.*, 2012; Liñán *et al.*, 2011; Nowinski and Haddoud, 2019; Westhead and Solesvik, 2015; Wilson *et al.*, 2007).

We administered the online survey from 21 October 2021 to 1 December 2021 to all 58,875 students enrolled in the University of Strasbourg, thus addressing the issue raised by Heuer *et al.* (2014) regarding the causality between education and entrepreneurial intention. We do not focus solely on MBA students or entrepreneurship-based diplomas, thereby reducing a selection bias regarding high levels of entrepreneurial intention. The cross-sectional survey included questions on students' entrepreneurial intentions and financial literacy as well as their detailed demographic and personal information. In all, 11,227 responses were obtained.

After excluding the responses with missing values, the final dataset contained 8,274 responses. We consider as missing values all the responses that do not provide any information about financial literacy. In Table 1.1, we report the descriptive statistics of the variables we use. The mean age of the respondents is 21.5 years. 67.43% are female. 26.69% are currently following a bachelor's degree in the first year; 18.48% are in the second year of their bachelor's degree; and 18.36% are in the third (i.e., the last) year of their bachelor's degree. 16.25% of the students are engaged in the first year of their master's degree whereas 15.43% are in the second

year of their master's degree. Finally, 4.86% of the students are Ph.D. students or are engaged in a higher degree.

Table 1. 1 Descriptive statistics

Variables	N	Mean	SD	Median	Min	Max
EI dummy	8,274	0.1918	0.3937	0	0	1
Objective FL	8,274	2.1000	0.9205	2	0	3
FL Interest	8,274	0.8272	0.3781	1	0	1
FL Inflation	8,274	0.6593	0.4743	1	0	1
FL Risk	8,274	0.6145	0.4868	1	0	1
Subjective FL	8,274	3.0260	1.4074	3	1	7
Risk Attitude	8,274	5.8991	2.2078	6	0	10
Role mentor	8,274	0.2698	0.4438	0	0	1
Age	8,274	21.5116	4.0425	21	16	75
Gender:						
Male	8,274	0.3389	0.4734	0	0	1
Female	8,274	0.6462	0.4782	1	0	1
Other	8,274	0.0149	0.1210	0	0	1
Faculty:						
Social Sciences	8,274	0.2811	0.4496	0	0	1
Business and Economics	8,274	0.1080	0.3105	0	0	1
Natural Sciences	8,274	0.0789	0.2696	0	0	1
Formal Sciences	8,274	0.1051	0.3068	0	0	1
Humanities	8,274	0.2314	0.4218	0	0	1
Life Sciences	8,274	0.1873	0.3901	0	0	1
Other faculties	8,274	0.0082	0.0896	0	0	1
Current Degree:						
First Year Bachelor	8,274	0.2612	0.4393	0	0	1
Second Year Bachelor	8,274	0.1859	0.3890	0	0	1
Third Year Bachelor	8,274	0.1869	0.3898	0	0	1
First Year Master	8,274	0.1633	0.3696	0	0	1
Second Year Master	8,274	0.1564	0.3696	0	0	1
Ph.D.	8,274	0.0463	0.2103	0	0	1

3.2. Variables and measures

Our variable of interest is entrepreneurial intention. To capture students' entrepreneurial intention, we ask: '*During or right after your studies, do you plan to start a new business?*' This question relies on the Global Entrepreneurship Monitoring (GEM)[14] measure of entrepreneurial intention. Students answer using a 5-point Likert scale. The possible responses are *'Totally not'*, *'Not really'*, *'Neither yes nor no'*, *'Probably yes'* and *'Yes, it's a certitude'*.

From the scale, we created a dummy, *EI dummy*. Responses between 1 and 3 (i.e., responses from *'Totally not'* to *'Neither yes nor no'*) are coded as 0 for the dummy, and responses between 4 and 5 are coded as 1. In the sample, 19.67% of the students have a score of 1.

The financial literacy of individuals is the independent variable of the different models in this study. Students are administered the *Big Three* financial literacy questions, from the seminal work of Lusardi and Mitchell (2014). The measure of financial literacy implies considering three factors that are determinants for the financial literacy of individuals. The first factor that is measured is the ability to understand compound interest. We ask students how much there would be in a hypothetical savings account, with an interest rate of 2%, after letting on this account 100€ for 5 years. Students had the choice between, *'Less than 102€'*, *'More than 102€'*, *'Exactly 102€'*, or *'I don't know'*. The correct answer is *'More than 102€'*. The second factor captured is the ability to understand inflation. We ask students what they could buy using a hypothetical savings account with 100€ on it, with an interest rate of 2% and an inflation rate of 3%. The possible responses are *'Less than today'*, *'Exactly the same as today'*, *'More than today'*, and *'I don't know'*. The correct answer is *'Less than today'*. The last factor defining baseline financial literacy is the understanding of risk and risk diversification. The measure is a true or false question, asking respondents if investing in a single stock company would provide a safer return than investing in a mutual fund. The correct answer is *'False'*.

For each question, a score of 0 is assigned to those who wrongly answer or who don't know the answer and 1 for those who correctly answer the question. Next, we add all correct and incorrect answers for each student to obtain a total score of financial literacy, *Objective FL*,

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[14] http://gem-consortium.ns-client.xyz/wiki/1182

which ranges from 0 to 3. The mean and median score for the sample is 2.09 and 2, respectively. In the sample, 82.25% of the students correctly answer the question about compound interests, 65.63% rightly answer the inflation question, and 61.24% to the risk and risk diversification question. Lusardi and Mitchell (2014) provide several statistics regarding national levels of financial literacy. The students in our study did not perform as well as those in New Zealand and Australian populations but performed better than the other populations (Lusardi and Mitchell, 2014) and also scored higher than the French general population, which has a 48% rate of correct answers to the interest question (Lusardi and Mitchell, 2014). We find a similar tendency for the inflation rate question. By contrast, the students we survey performed less well (61.24% correct answers) in the risk diversification question than the French population (66.8%) (Lusardi and Mitchell, 2014). Within the sample, 41.37% correctly answered all three financial literacy questions compared with 30.9% of the French population. Therefore, students in this sample are more financially literate than the general population.

We also investigate the students' perception of their financial literacy through the variable *Subjective FL.* We use the measure designed by Allgood and Walstad (2016). This self-assessed financial literacy questionnaire is rated on a 7-point Likert scale. The mean and median subjective financial literacy score is 3.03 and 3, respectively. We observe that the average subjective financial literacy of students in the sample is 3.0362, which is considerably lower than that among the general US population (4.9474) in the study by Allgood and Walstad (2016). Our study investigates the effect of financial literacy as an individual determinant of entrepreneurial intention. Thus, we control for other individual determinants of entrepreneurial intention found in the literature.

Risk Attitude is considered a strong determinant of entrepreneurial intention (Seagal *et al.*, 2005) and has a positive influence on entrepreneurial intention (Bird, 1988; Brockhaus 1980; Chen *et al.*, 1998; Sandhu *et al.*, 2011; Seagal, 2005, Zhao *et al.*, 2005; Zhang and Cain, 2017). We measure *Risk Attitude* using Dohmen *et al.* (2011) subjective measure. We use a single 11-point Likert scale to investigate students' *Risk Attitude*. We ask students to assess their attitude toward risk, with 0 being the most risk-averse attitude and 10 the most risk-loving attitude. Although this measure is subjective, Dohmen *et al.* (2011) provide detailed evidence that the Liker scale is as reliable as lottery-based experimental measures of *Risk Attitude* for predicting individuals' risk attitude.

Zhao *et al.* (2005) show that being a female negatively influences entrepreneurial intention. They conduct their study by surveying American MBA Students. Wilson *et al.* (2007) highlight that gender negatively influences entrepreneurial intention for both Middle and High School students and MBA students. We set a variable *Gender* equal to 0 for men, 1 for women, and 2 for other genders. We also control for the age of the students, which potentially influences the likelihood of entrepreneurial intentions (Schlaegel and Koenig, 2014). *Age* is calculated by subtracting the date of birth of surveyed students from 2021 (the survey took place at the end of 2021). Regarding the intention to start a business, the figure of an entrepreneurial mentor or model, within the close relationships circle plays a determinant role (Laviolette *et al.*, 2012; Nowinski and Haddoud, 2019). An inspiring model or mentor refers to an individual that embodies a specific behavior, for other individuals. As it represents a behavior, the inspiring model is charged with the values, beliefs, and representations that are attached to the concerning behavior. In the case of entrepreneurial behavior, the figure of the inspiring model is generally an entrepreneur that the individual knows personally. Liñán and Chen (2009) observe a positive relationship between the presence of a role model (i.e., an inspiring model) and the attitude toward entrepreneurship of students. Similarly, Liñán *et al.* (2011) investigate the presence of the relationship between a mentor and the entrepreneurial intention of 354 MBA Spanish students, finding similar positive results to previous studies. The same results are found for Spanish high school students (Sanchez, 2013) and American students (Kickul *et al.*, 2008). Regarding family influence, Carr and Sequeira (2007) show that family exposure to business mentors positively influences entrepreneurial intention. Thus, we set a dummy *Role Mentor* = 0 for students with no parent entrepreneur and 1 for students with a least one parent entrepreneur.

Zhang *et al.* (2014) underlined the effect of years of education on entrepreneurial intention. Therefore, we control for the students' education level. We set a categorical variable *Current Degree* equal to 1, 2, and 3 if the student is currently following a first, second, and third year, respectively, in a bachelor's degree; 4 and 5 for the first and second years, respectively, in a master's degree; and 6 for the Ph.D. degree. In the following regressions, we set *Bachelor 1* as the base level. We also control the faculty from which the students come (Moriano *et al.*, 2012; Zhang *et al.*, 2014). We set a categorical variable *Faculty* by asking students in their department of the university. Table 1.2 summarizes the definitions of the variables.

Table 1. 2 Definition of the variables

In the first column, we specify the name of the variables used in the model. The second column presents how the variable is measured. The third column specifies the use of the variable in the model and the fourth column presents the type of each variable. The last column presents references for each variable.

Variables	Measure	Use in the model	Type of variable	Source
EI scale	5-point Likert scale	Dependent variable	Categorical	Global Entrepreneurship Monitor (2018)
EI dummy	=0 if *EI (scale)*=1;2;3 =1 if *EI (scale)*=4;5	Dependent variable	Dummy	Global Entrepreneurship Monitor (2018)
FL Interest	Understanding of how compound interests work: =0 if wrong or "I don't know" =1 if right	Independent variable	Dummy	Lusardi and Mitchell (2014)
FL Inflation	Understanding of how inflation works: =0 if wrong or "I don't know" =1 if right	Independent variable	Dummy	Lusardi and Mitchell (2014)
FL Risk	Understanding of what risk and risk diversification are =0 if wrong or "I don't know" =1 if right	Independent variable	Dummy	Lusardi and Mitchell (2014)
Objective FL	Total score for the Big Three questions (*FL Interest + FL Inflation + FL Risk*)	Independent variable	Categorical	Lusardi and Mitchell (2014)
Subjective FL	Self-assessment on a 7-point Likert's scale	Independent variable	Categorical	Allgood and Walstad (2016)
Risk Attitude	11-points Likert scale	Control variable	Categorical	Dohmen *et al.* (2011)
Age	2021-Year of birth	Control variable	Continuous	Schlaegel and Koenig (2014)
Gender	=0 if Male =1 if Female =2 if Other	Control variable	Categorical	Wilson *et al.* (2007)
Role Mentor	=0 if no parent entrepreneur =1 if at least one parent entrepreneur	Control variable	Dummy	Laviolette *et al.* (2012)
Faculty	Dummy for each Faculty: Social Sciences Business or Economics Natural Sciences Formal Sciences Humanities Life Sciences Other faculties	Control variable	Dummy	Moriano *et al.* (2012)
Current Degree	=1 if First year Bachelor =2 if Second year Bachelor =3 if Third year Bachelor =4 if First year Master =5 if Second year Master =6 if Ph.D.	Control variable	Categorical	Zhang *et al.* (2014)

Students in this sample derive from the general student population regarding some socio-demographic characteristics. Indeed, 64.62% of the sampled students are female, whereas females represent 58.57% of the total student population at the University of Strasbourg[15]. Female overrepresentation is common in sample-based studies (Smith, 2008). The median age at the University level is 21, which is similar to the age of students in the sample. Students in Social Sciences and Humanities represent 51.25% of the sample, whereas they represent 42.03% of the sample. Although students in Humanities and Social Sciences are overrepresented in the sample, these two faculties are the largest ones within the University of Strasbourg. Therefore, students in the sample still follow the tendency found at the university level. Bachelor's students represent 63.40% of the sample and 67.73% of the university's population. Master's students represent 31.97% of the sample and 27.10% of the university's population. As the median age of the sample is the same as the university's population, the overrepresentation of master's degree students suggests that students in the sample succeed more in their studies. Overall, although the representativeness of the sample is not fully fitting with the population of interest, the general tendencies are the same between the sample and the population. Therefore, we suggest that results derived from the sampled students can be extended to the population of interest.

4. Results

To test hypotheses H1, H2, and H4 we rely on probit estimations as the dependent variable, *EI dummy* is dichotomous. H1 and H2 suggest that the students' objective and subjective financial literacy, respectively, positively influence their entrepreneurial intention. H4 suggests that objective financial literacy negatively influences entrepreneurial intention. As explanatory variables, we use *FL Interest*, *FL Inflation*, and *FL Risk*, which are the Big Three financial literacy questions (Lusardi and Mitchell, 2014) capturing the objective level of financial literacy of students. We use *Subjective FL*, from Allgood and Walstad (2016) to investigate the subjective financial literacy of students. Table 1.3 reports the coefficients of the probit estimations.

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[15]We use statistics from the University of Strasbourg to compare students in the sample to the general population. For privacy concerns, the statistics cannot be displayed. A summarized version can be found on the website of the University of Strasbourg: https://en.unistra.fr/about-us/facts-and-figures

Table 1. 3 Probit model

Table 1.3 reports the coefficients for the probit models estimating the likelihood of students having a high entrepreneurial intention. Model 1 tests the effect of the understanding of how compound interest (*FL Interest*) rates work on students' entrepreneurial intention. Model 2 tests the effect of the understanding of the inflation mechanism (*FL Inflation*) on entrepreneurial intention. Model 3 tests the effect of the understanding of risk and risk diversification (*FL Risk*) on entrepreneurial intention. Model 4 tests the effect of the three dimensions of financial literacy altogether. Model 5 tests the effect of subjective financial literacy (*Subjective FL*) on entrepreneurial intention. Finally, Model 6 tests both the effects of the dimensions of objective financial literacy and the effects of subjective financial literacy on entrepreneurial intention. In all models we control for the attitude toward risk of students (*Risk Attitude*), the age of students (*Age*), the presence of at least one parent entrepreneur (*Role Mentor*), the gender of students (*Gender*), the current level of diploma the students reach (*Current Degree*) and the faculty of study of students (*Faculty*). The coefficients are reported only for binary and continuous variables. Categorical variables are noted as "Yes" when included in the regressions. The coefficients for the categorical variables are available on demand. Standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$

VARIABLES	(1)		(2)		(3)		(4)		(5)		(6)	
					EI dummy (probit)							
Independent variables:												
FL Interest	-0.0308						-0.0405				-0.0331	
	(0.0455)						(0.0472)				(0.0474)	
FL Inflation			-0.0035				-0.0162				-0.0304	
			(0.0365)				(0.0382)				(0.0384)	
FL Risk					0.1122	***	0.1181	***			0.0884	***
					(0.0359)		(0.0366)				(0.0369)	
Subjective FL									0.0933	***	0.0902	***
									(0.0127)		(0.0128)	
Controls:												
Risk Attitude	0.1809	***	0.1810	***	0.1791	***	0.1790	***	0.1681	***	0.1672	***
	(0.0085)		(0.0085)		(0.0085)		(0.0085)		(0.0087)		(0.0087)	
Age	0.0347	***	0.0347	***	0.0350	***	0.0351	***	0.0315	***	0.0320	***
	(0.0044)		(0.0044)		(0.0044)		(0.0044)		(0.0044)		(0.0044)	
Role Mentor	0.1679	***	0.1672	***	0.1669	***	0.1677	***	0.1602	***	0.1607	***
	(0.0367)		(0.0366)		(0.0367)		(0.0367)		(0.0368)		(0.0368)	
Gender	Yes		Yes		Yes		Yes		Yes		Yes	
Current Degree	Yes		Yes		Yes		Yes		Yes		Yes	
Faculty	Yes		Yes		Yes		Yes		Yes		Yes	
Constant	-2.6343	***	-2.6561	***	-2.7328	***	-2.6950	***	-2.8523	***	-2.8593	***
	(0.1208)		(0.1177)		(0.1182)		(0.1250)		(0.1192)		(0.1261)	
Observations	8,274		8,274		8,274		8,274		8,274		8,274	
Log likelihood	-3600.9900		-3601.2141		-3596.3236		-3595.7452		-3574.2289		-3571.0244	
Pseudo R²	0.1097		0.1096		0.1108		0.1110		0.1163		0.1171	
LR Chi²	887.19	***	886.74	***	896.52	***	897.68	***	940.71	***	947.12	***

In Model 1, the coefficient for *FL Interest* is not significant, suggesting that having a better understanding of how compound interest works is not related to students' entrepreneurial intention. Similarly, *FL Inflation* in Model 2 has no significant influence on the students' entrepreneurial intention. In Model 3, the coefficient for *FL Risk* is positive and significant (β = 0.1122, p < 0.01). Students who correctly answer the question on risk and risk diversification are more likely to have a high entrepreneurial intention. The results remain similar when testing the three dimensions of objective financial literacy altogether, in Model 4. Therefore, H1 is only supported for the dimension of financial literacy related to the understanding of risk and risk diversification. In Model 5, we test the effect of subjective financial literacy on entrepreneurial intention. We observe that students with a higher subjective financial literacy are more likely to have a high entrepreneurial intention (β = 0.0953, p < 0.01), which supports H2. Finally, Model 6 tests simultaneously the effects of *FL Interest*, *FL Inflation*, *FL Risk*, and *Subjective FL* on entrepreneurial intention. In Model 6, the coefficients for *FL Risk* (β = 0.0884, p < 0.01) and *Subjective FL* (β = 0.0902, p < 0.01) remain positive and significant, confirming previous results. The results in Table 1.3 do not show a negative and significant influence of financial literacy on entrepreneurial intention. Therefore, the results do not support hypothesis H4.

To evaluate the mediating effect mentioned in H3, we rely on the causal mediation interpretation approach proposed by Imai *et al.* (2010, 2011). Traditional mediation methods (e.g. Baron and Kenny, 1986) are designed for linear models, whereas Imai *et al.* (2010) used nonlinear models with dichotomous dependent and mediator variables (Hicks and Tingley, 2011). In our study, the causal mediation approach calculates how much of *FL Risk*[16] is transmitted to *EI dummy* by the mediating variable *Subjective FL*. This estimate is the average causal mediation effect (ACME). Also of interest is the average direct effect (ADE) of *FL Risk* on *EI (dummy)*. Imai *et al.* (2010, 2011) also calculated the average total effect (ATE) of *FL Risk* on *EI dummy*. The procedure of the causal mediation approach follows two steps. First, the approach fits models for the outcome and mediating variables. First, the causal mediation analysis fits the model where *FL Risk* explains *Subjective FL* (mediating model). Next, the causal mediation approach fits the model where *FL Risk* explains *EI dummy* (outcome model).

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[16] We conducted additional mediation analyses using *FL Interest* and *FL Inflation* as independent variables. The results of the mediation analyses are not significant for both, confirming that *FL Risk,* the understanding of risk and risk diversification, is the sole dimension of objective financial literacy that affects entrepreneurial intention.

In the second step, the causal mediation approach calculates the ACME, ADE, and ATE of *FL Risk* on *EI dummy* and reports confidence intervals for each estimate. Estimates and confidence intervals are calculated using bootstrap resampling. Hicks and Tingley (2011) suggest that 1000 resamples is the lower limit for moderately accurate causal mediation analysis, with more resamples producing more accurate mediation analysis. We therefore used 5000 resamples for the causal mediation analysis. Table 1.4 reports the estimates for the second step of the causal mediation analysis[17].

Table 1. 4 Causal mediation analysis

Table 1.4 reports the mean effects of *FL Risk* on *EI dummy*, for both the direct effect and the effect mediated by the variable *Subjective FL*. The first row reports the Average Total Effect (ATE) which is the total effect of *FL Risk* on *EI dummy*, direct and indirect. The Average Causal Mediation Effect (ACME) is the effect of *FL Risk* on *EI dummy* which is mediated by *Subjective FL*. The Average Direct Effect (ADE) is the effect of *FL Risk* on *EI dummy* which is not mediated by *Subjective FL*. The last row reports the percentage of the total effect of *FL Risk* on *EI dummy*, which is mediated by *Subjective FL*. The implementation (medeff routine in Stata 18; Hicks and Tingley, 2011) adopts a quasi-Bayesian Monte Carlo simulation-based approach to estimate the coefficient confidence intervals. The causal mediation approach requires two values of the independent variable to statistically test contrasts. Hicks and Tingley (2011) suggest that 1000 resamples is the lower limit for moderately accurate causal mediation analysis, and that more numerous resamples will produce more accurate mediation analysis. We set 5000 resamples for the causal mediation analysis in this study. After the mediation analysis, we perform a sensitivity analysis using Hicks and Tingley's (2011) *medsens* Stata package. The result of the sensitivity analysis is in the second part of Table 1.4. The level of sensitivity is the ρ at which the ACME=0, which is the correlation of the error terms in the outcome and the mediator models. As long as the correlation between error terms is under 0.1, the ACME is guaranteed to stay positive.

FL Risk→Subjective FL→EI dummy			
Mediation analysis	Mean	[95% Confidence Interval]	
Average Total Effect (ATE)	0.0358	0.0357	0.0524
Average Causal Mediation Effect (ACME)	0.0103	0.0076	0.0132
Average Direct Effect (ADE)	0.0255	0.0083	0.0421
% of Total Effect Mediated (all students)	0.2877	0.1960	0.5461
Sensitivity analysis			
ρ at which ACME=0	0.1		

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[17] On demand, we can provide the estimates for the first step of the causal mediation analysis, that is model fitting.

H3 is supported by the causal mediation analysis. We expect a positive mediating effect of *Subjective FL* on the relationship between *FL Risk* and *EI dummy*. The ACME of *Subjective FL* is positive (0.0103) with a confidence interval ranging from 0.0357 to 0.0524. Zero is not included in the interval, which means that the positive effect of *Subjective FL* on the relationship between *FL Risk* and *EI dummy* is significant. The ADE of *FL Risk* on *EI dummy* is positive (0.0255) and significant since the confidence interval ranges from 0.0083 to 0.0421. Therefore, the causal mediation analysis also supports H1. The ATE is positive (0.0358) and significant with a confidence interval ranging from 0.0357 to 0.0524. The ATE is the addition of the average direct total effect and the ACME. The ATE of *FL Risk* on *EI dummy* is positive and significant. This is consistent with the results in Table 1.3.

Because unconfoundedness, exogeneity, and an absence of omitted variable bias are key assumptions in causal mediation analysis for which violations cannot be directly tested, we perform a sensitivity analysis, as recommended by Hicks and Tingley (2011). The sensitivity analysis shows that the results are moderately unaffected by possible unobserved confounders. The level of sensitivity is the ρ at which the ACME= 0. The ρ parameter is the correlation of the error terms of the outcome and mediating used in the first step of the causal mediation analysis. The parameter $\rho=0.1$ for the causal mediation analysis, which is consistent with the findings of existing empirical studies (Imai *et al.*, 2010, 2011).

Overall, our results support H1, H2, and H3. We observe that objective financial literacy has a positive and direct influence on entrepreneurial intention (*EI dummy*). For objective financial literacy, only the understanding of risk and risk diversification (*FL Risk*) has a positive and significant influence on entrepreneurial intention. In addition, 28.77% of the total effect of the understanding of risk on entrepreneurial intention is positively mediated by the subjective financial literacy of students. Subjective financial literacy also positively influences the students' entrepreneurial intention.

5. Robustness checks

Our results assume that the distribution of objective financial literacy and the subjective financial literacy of students is unaffected by students' characteristics and that the influence of financial literacy on *EI dummy* is not due to unobserved cofounders. These two assumptions, if not validated, lead to a selection bias. To check for the validity of these assumptions and the potential selection bias, we specify a propensity score matching (PSM) model (Heckmann *et*

al. 1998a, 1998b; Tucker, 2010). First, the PSM model calculates for each student a propensity score of having a high financial literacy, according to observable characteristics. We use as observable characteristics the determinants of students' financial literacy we find in the literature (Brau *et al.*, 2019): *Age*, *Gender*, *Current Degree*, *Already Worked*, *Internship*, and *Parents' Degree*. *Age*, *Gender*, and *Current Degree* are used in the main estimations as well and are defined in section 2. Additionally, we create a dummy *Already Worked* = 1 if students already had a paid job during their schooling or currently have one and = 0 if not. We also create a dummy *Internship* = 0 if the student never did an internship and = 1 if the student already did an internship. The variable *Parent Degree* assigns a value of 1 if the parent has less than a high school degree, 2 for a high school degree or an equivalent diploma, 3 for a 2-year bachelor's degree or a diploma, 4 a complete 3-year bachelor's degree, 5 for a 1-year master's degree or equivalent, 6 for a complete master's degree, and 7 for a Ph.D. education or equivalent. We ask students about their two parents, so we use two categorical variables, *Parent 1 Degree* and *Parent 2 Degree*. The PSM approach only accepts dichotomous treatment variables and thus, we create a dummy *Subjective FL dummy* = 0 if the subjective financial literacy of the student is below the median subjective financial literacy of the sample and = 1 if over the median. The first step of the PSM model[18] reveals that the selected variables can significantly predict the students' financial literacy and help differentiate between financially literate and financially illiterate students. The identifying variables are *Parent 1 Degree* and *Parent 2 Degree*, *Gender*, *Current Degree*, Age, and *Already Worked*.

In the second step, the PSM model matches students with high financial literacy with students with low financial literacy who have similar propensity scores of having a high financial literacy. Then the second step of the PSM model calculates the average difference in *EI dummy*, between students with a high financial literacy and students with a low financial literacy. Table 1.5 reports the average differences for both groups of students and each measure of financial literacy (*FL Interest*, *FL Inflation*, *FL Risk*, and *Subjective FL*). Table 1.5 first reports the ATE. The ATE is the average difference in the outcome variable (*EI dummy)* due to the treatment variable (*FL Interest*, *FL Inflation*, *FL Risk*, or *Subjective FL*), without matching students. The ATE represents the overall effect of each treatment variable on *EI* dummy. Table 1.5 also reports the ATE on the treated (ATT) for comparing financially literate students to

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[18] On demand, we can provide the estimates of the first step of the PSM model.

financially illiterate students, with similar characteristics (i.e. with similar propensity scores). Therefore, the ATT is the estimation of main interest in the PSM since the ATT is the average effect of financial literacy on *EI dummy*, after matching students. We find that the difference in *FL Risk* among students explains the difference in *EI dummy* (ATT = 0.0567, $p < 0.001$) and the difference in *Subjective FL dummy* explains the difference in *EI dummy* (ATT = 0.1084, $p < 0.001$). This suggests that the differences in *EI dummy* due to *FL Risk* and *Subjective FL* are not caused by students' other characteristics or unobserved confounders (Tucker, 2010). The results of the PSM model are consistent with the main estimations. Therefore, our results are unaffected by selection bias.

Table 1. 5 Second step of the propensity score matching

Table 1.5 reports the coefficients for the second step of the propensity score matching approach. The Average Treatment Effect (ATE) is the average difference in the outcome variable *EI dummy*, when all the population (all students) are treated (they are considered to have a high financial literacy). The Average Treatment Effect on the Treated is the average difference in the outcome variable *EI dummy*, when treating only students with high financial literacy. For the ATT, students with high financial literacy (Treatment=1) are compared to similar students with low financial literacy (Treatment=0). In each model, the treatment variable is used to compare students and is alternatively *FL Interest*, *FL Inflation*, *FL Risk*, and *Subjective FL dummy*. The characteristics on which students are matched are *Parent 1 Degree* and *Parent 2 Degree*, *Gender*, *Current Degree*, Age, and *Already Worked*.

Abadie and Imbens' (2011) robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

	Propensity Score Matching: *EI dummy*						
	(1)		(2)		(3)		(4)
	Treatment: *FL Interest*		Treatment: *FL Inflation*		Treatment: *FL Risk*		Treatment: *Subjective FL dummy*
Average Treatment Effect (ATE)	-0.0009		0.0185		0.0550	***	0.1053 ***
	(0.0160)		(0.0119)		(0.0126)		(0.0123)
Average Treatment Effect on Treated (ATT)	-0.0026		0.0258	*	0.0567	***	0.1084 ***
	(0.0175)		(0.0139)		(0.0126)		(0.0131)
Observations	7,159		7,159		7,159		7,159

Endogeneity can occur when changes in the explanatory variable are caused by changes in the outcome variable. This form of endogeneity is labelled reverse causality (Hill *et al.* 2021). Specifically, the level of financial literacy of students may not be influenced by the students' entrepreneurial intention. However, given that students with a higher entrepreneurial intention may increase their financial literacy to have more chances to succeed in their entrepreneurial project, our results might be influenced by reverse causality. Therefore, in the empirical analysis, we use an instrumental variables (IV) probit estimator (Hill *et al.* 2021), which replaces the financial literacy variable with an instrument in the model. As only *FL Risk* has a significant influence on *EI dummy* in the main estimations, we apply an instrument only to *FL Risk*. IV probit estimation generates a Wald exogeneity test statistic that assesses the importance of endogeneity (Wooldridge, 2002). We propose the following instrument: *Internship.* In this sample, we investigate whether or not students already did an internship, which is a determinant of students' financial literacy (Brau *et al.*, 2019). We create a dummy *Internship* = 1 if the student already did an internship in any company, administration, or nonprofit organization, and 0 if not. Since internships are not necessarily oriented toward entrepreneurship, we suggest that there is no link between doing an internship and the students' entrepreneurial intention[19]. Table 1.6 reports the results of the IV probit. In the first stage regression, *Internship* is found to be a valid instrument for *FL Risk*. Indeed, *Internship* has a positive and significant influence on *FL Risk* (β = 0.0296, $p < 0.01$). In the second stage, the Wald test of exogeneity is not significant, which means that the instrument *Internship* is exogeneous. In the second stage, the influence of *FL Risk* on *EI dummy* is positive and significant (β = 1.3139, $p < 0.1$), which is consistent with the main estimations. Therefore, the results of the IV probit model confirm that the main estimations in this study are not caused by reverse causality

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[19] We conducted additional estimations to check for this assumption, that are available on demand. We use a probit estimator, which shows that doing an internship does not increase the likelihood of students having a high entrepreneurial intention.

Table 1. 6 IV probit model

Table 1.6 reports the coefficients for the IV probit model. First, Table 1.6 reports the coefficients for the first stage of the IV. The first step uses a probit estimator to determine whether the select instrument variable (*Internship*) is related to the instrumented variable (*FL Risk*). In the second step, we use instrumented *FL Risk* as the independent variable, and *EI dummy* as the dependent variable. we control for the attitude toward risk of students (*Risk Attitude*), the age of students (*Age*), the presence of at least one parent entrepreneur (*Role Mentor*), the gender of students (*Gender*), the current level of diploma the students reach (*Current Degree*) and the faculty of study of students (*Faculty*). The coefficients are reported only for binary and continuous variables. Categorical variables are noted as "Yes" when included in the regressions. The coefficients for the categorical variables are available on demand. Table 1.6 also reports the Wald's test of exogeneity. The null hypothesis (not rejected when p>0.1) is exogeneity of *Internship*.

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	First Stage FL Risk		Second Stage EI (dummy)	
Internship	0.0296	**		
*FL Risk (*Instrumented)			1.3139	*
			(0.7968)	
Risk Attitude	0.0158	***	0.1260	**
	(0.0024)		(0.0643)	
Age	-0.0028	*	0.0316	
	(0.0016)		(0.0090)	
Role mentor	0.0042		0.1291	**
	(0.0118)		(0.0686)	
Gender	Yes		Yes	
Current Degree	Yes		Yes	
Faculty of study	Yes		Yes	
Constant	0.6559	***	-3.0220	***
	(0.0380)		(0.2570)	
Observations	8,274			
Log pseudolikelihood	9191.1695			
Wald Chi²	1348.54			***
Wald test of exogeneity	1.25			

6. Discussion

This study employs the theoretical frameworks of the Theory of Planned Behaviour (Ajzen, 1991) and the Private Equity Premium Puzzle (Moskowitz and Vissing-Jørgensen, 2002) to investigate the impact of financial literacy on entrepreneurial intention. In light of the theory of planned behavior, it can be posited that financial literacy may constitute a component of the behavioral control of individuals with regard to entrepreneurship, thereby potentially enhancing their entrepreneurial intention. The association between financial literacy and entrepreneurial intention is investigated using a dataset obtained from a large sample of 8,274 French university students. The analysis employs probit estimations and causal mediation analysis. The first hypothesis (that objective financial literacy positively influences entrepreneurial intention) is partially supported. The results demonstrate that an understanding of risk and risk diversification, one of the dimensions of objective financial literacy, positively influences students' entrepreneurial intention. H2 (subjective financial literacy positively influences entrepreneurial intention) is supported. Furthermore, the results indicate that subjective financial literacy acts as a mediator between objective financial literacy and entrepreneurial intention, thereby supporting H3. H4 (objective financial literacy negatively influences entrepreneurial intention) is not supported by the evidence. Finally, robustness tests indicate that our results are unaffected by selection bias and reverse causality.

A considerable number of studies on entrepreneurial intention have evaluated perceived behavioral control (Maheswari *et al.*, 2022), yet few have analysed actual behavioral control. We suggest that objective financial literacy is a constitutive factor in individuals' actual behavioral control with regard to entrepreneurship. The results of this study indicate that one dimension of financial literacy, specifically the understanding of risk and risk diversification, is positively associated with entrepreneurial intention. To the best of our knowledge, this study represents the first empirical investigation of the effect of actual behavioral control on entrepreneurial intention. In conclusion, our findings contribute to the existing body of knowledge on entrepreneurial intention by identifying objective financial literacy as a novel determinant of entrepreneurial intention.

Additionally, our findings suggest that an individual's subjective financial literacy is positively associated with their entrepreneurial intention. It is proposed that subjective financial literacy is a constitutive factor in individuals' perceived behavioral control with regard to entrepreneurship. This is consistent with the theory of planned behavior (Ajzen, 1991), which originally posits that perceived behavioral control is also a predictor of individuals' intention. The concept of perceived behavioral control has been extensively employed by the entrepreneurship literature to elucidate the processes by which individuals develop their entrepreneurial intentions (Meoli *et al.*, 2020). Consequently, our findings are in alignment with the existing body of literature. This study highlights the reliability of subjective financial literacy as a measure of individuals' perceived behavioral control on entrepreneurship and its role as a determinant of individuals' entrepreneurial intention. Furthermore, our findings indicate that the positive influence of objective financial literacy on entrepreneurial intention is partially mediated by subjective financial literacy. This finding is also consistent with the theory of planned behavior, which posits that perceived behavioral control mediates the relationship between actual behavioral control and entrepreneurial intention. Although the mediation of perceived behavioral control on the relationship between actual behavioral control and entrepreneurial intention is theoretically developed (Ajzen, 1991), empirical evidence for this mediation effect is lacking within the entrepreneurship literature. In this study, we utilise both objective and subjective measures of financial literacy, which respectively constitute actual and perceived behavioral control. The present study provides empirical evidence that the effect of actual behavioral control on entrepreneurial intention is partially mediated by perceived behavioral control. Consequently, our study contributes to the extant literature on

entrepreneurial intention by investigating the effects of each dimension of behavioral control on entrepreneurial intention.

Furthermore, our research contributes to the field of entrepreneurial education literature. Although the literature highlights the positive effect of entrepreneurial education on entrepreneurial intention (Heuer *et al.*, 2014; Souitaris *et al.*, 2007), Hägg and Gabrielsson (2019) call for a more detailed analysis of the specific type and contents of education that have a significant impact on entrepreneurial behaviors. Ahmed and Klobas (2017) argue that current entrepreneurial educational programmes must incorporate new content in order to be effective in fostering entrepreneurial intention. This concurs with the findings of Kassean *et al.* (2015) and Osterbeek *et al.* (2010), who observed that entrepreneurship courses could potentially reduce the entrepreneurial intention of participants. This occurs when the contents of courses make participants more aware of the difficulties involved in successfully running a business. Consequently, this body of literature is consistent with the 'back to reality effect' that we propose in this study. This study demonstrates that financial literacy, both objective and subjective, positively influences individuals' entrepreneurial intention. Consequently, we propose that financial literacy does not result in individuals being "re-immersed" in the reality of entrepreneurship and that it is a positive determinant of individuals' entrepreneurial intention.

This research also contributes to the nascent literature on the definition of entrepreneurial literacy. This nascent concept defines all the knowledge and skills that entrepreneurs use when starting and running their businesses. Due to the broad nature of entrepreneurial activities, the sills and knowledge necessary to succeed in entrepreneurial activities are various and involve creativity, management, commercial, and financial knowledge. Currently, the literature does not provide a clear definition of what entrepreneurial literacy is. In this study, we show that financial literacy is a determinant of individuals' intention to start a business. This result suggests that financial literacy is a constitutive element of broader entrepreneurial literacy. We therefore contribute to setting a clear definition of which knowledge (i.e. financial knowledge) is part of the entrepreneurial literacy of individuals.

The findings of this study offer a practical contribution for those engaged in entrepreneurial education. The results of this study indicate that the dimension of financial literacy that requires the greatest attention within entrepreneurial education courses is the understanding of risk and risk diversification. The results of this study demonstrate that one of

the key strategies that entrepreneurship instructors can employ to foster entrepreneurial intention is to enhance their students' subjective financial literacy.

7. Limitations and conclusion

This study has several limitations. First, the cross-sectional survey precluded the assessment of how the evolution of financial literacy at the individual level influences entrepreneurial intention. Future studies should design longitudinal studies, thus investigating the evolution of financial literacy across time and its effects on entrepreneurial intention. Second, although we employed a larger sample of students from a major French university, we did not investigate the students' cultural characteristics, which can influence both their financial literacy and entrepreneurial intention. Future studies should add cultural characteristics as control variables. Indeed, Arrondel (2017) highlights that financial literacy and financial education are of less interest to the French population than to the US population for several reasons, including retirement planning: while Americans need to personally plan their retirement (and other health and life care services), the French people benefit from the state's support that allows them to allocate less effort to life planning. Therefore, cross-country studies with multicultural samples are warranted to further explore this. Finally, Armitage and Conner (2001) show that intention explains between 20% and 30% of the variance in entrepreneurial behaviors, including actual business creation. Similarly, another systematic review finds that on average, intention accounts for 28% of the variance of behaviors (Sheeran, 2002). Therefore, it is vital to distinguish between the drivers of entrepreneurial intention and the drivers of business creation. Although we show that financial literacy fosters entrepreneurial intention, further investigations are required to determine whether financial literacy transforms entrepreneurial intention into actual business creation.

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Chapter 2: The effect of entrepreneurs' financial literacy on SMEs' capital structure[20]

Abstract

The struggle of small and medium enterprises (SMEs) to access external finance has been largely documented. Pieces of literature highlight that among entrepreneurial micro-foundations of capital structure, entrepreneurs' education remains underinvestigated. The literature, however, highlights that entrepreneurs' ability to develop formal financial practice is related to improved access to finance for their SMEs. However, few studies have investigated how the objective financial knowledge of entrepreneurs influences their access to external finance and their use of leverage. In this study, we use the financial literacy of entrepreneurs, as a measure of their baseline financial knowledge. We investigate how the financial literacy of entrepreneurs influences their access to external finance and their cash management. We use three dimensions to define entrepreneurs' financial literacy: the understanding of how compound interests work, the understanding of how inflation works, and the understanding of what risk and risk diversification are. We test the relationship between each dimension of financial literacy and SMEs' capital structure using a sample of French SMEs. We use the AMADEUS database from Bureau Van Dijk to gather the financial information of French SMEs. We cross the financial data (2014-2023) to a survey we designed, in which we measure entrepreneurs' financial literacy. We obtain a sample of 1,761 firm-year observations. Results in this study show that only one dimension of financial literacy, the understanding of how compound interests work, is related to SMEs' leverage.

Keywords - *financial literacy; SMEs, capital structure, cash management; entrepreneurs' education*

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1. Introduction

Entrepreneurial activities follow an increasing trend, being attractive to a larger spectrum of individuals (Global Entrepreneurship Monitor, 2023). SMEs represent 90% of worldwide businesses (World Bank, 2019). However, difficulties in accessing external finance remain a major issue for SME growth (Hussain et al., 2018). For instance, between 2022 and 2023, firms in the Eurozone faced a decrease of 6% in credit lines availability and a decrease of 10% in bank loans availability (SAFE Report, 2023). This is consistent with previous studies (Ayyagari et al., 2006; Berger & Udell 2006) which observe that SMEs struggle to obtain external financing. Therefore, extensive investigations have been conducted to identify the determinants of SMEs' access to external financing (Kumar et al., 2020). Originally, the literature focused on determinants that explain firms' capital structure independently of their size (Rao et al., 2023). Such empirical investigations originally consider the firm-level determinants of firms' capital structure such as profitability, growth, industry, or firms' age, as determinants of SMEs' capital structure. Then, pieces of literature (Hussain et al., 2018; Imronudin and Hussain, 2016) have considered SMEs' specific determinants of capital structure, among which entrepreneurs' socio-demographic (Verheul and Thurik., 2001; Cowling et al., 2022) and entrepreneurial micro-foundations of capital structure (Cole et al., 2022) have been studied.

Among those entrepreneurial micro-foundations of capital structure, entrepreneurs' educational background appears as an under-investigated determinant of SMEs' capital structure. Indeed, some studies (Irwin and Scott, 2010) highlight that entrepreneurs' education is positively related to their access to external finance. Moreover, nascent literature (Hussain et al., 2018; Addo and Asante, 2022; Buchdadi et al., 2020) shows that the financial practices of entrepreneurs are related to SMEs' access to external finance. Contrary to large firms, SME owners' education and financial practices are particularly relevant to investigate. Indeed, while large firms rely on dedicated financial services or have access to personalized financial counseling, SME owners undertake financial decisions relying more on their personal knowledge. Moreover, top management teams in large firms tend to display a high educational level (Wiersema et al., 1992), while several studies documented the heterogeneity of entrepreneurs' education (Brinckmann and Kim, 2015; Delmar and Davidsson, 2000; Graham and Bonner, 2022; Viinikainen et al, 2017)

However, one theoretical issue in this nascent literature is that the financial practices of entrepreneurs are mistakenly considered as entrepreneurs' financial literacy. However, Mitchell and Lusardi (2015) argue that financial literacy and financial practices are two different concepts, such as financial literacy causes improved financial practices. Financial literacy is defined as the understanding of individuals regarding baseline financial concepts (Lusardi and Mitchell, 2008). Lusardi and Mitchell (2008) identify three concepts defining financial literacy (the *Big Three*): the understanding of how compound interests work, the understanding of how inflation works, and the understanding of what risk and risk diversification are. Thus, one main theoretical limit of the literature is the lack of studies that directly investigate how financial literacy influences SMEs' capital structure.

Few studies have investigated how the objective financial knowledge of entrepreneurs influences their access to external finance and their use of leverage. Basha et al. (2023) are the first to show that the objective level of financial education of entrepreneurs is related to the capital structure of SMEs. Using a cross-country sample, Basha et al. (2023) measure entrepreneurs' financial education through their financial literacy level. Nevertheless, Basha et al. (2023) use an aggregate score of financial literacy, which produces according to Lusardi and Mitchell (2023) unstable evidence. Therefore, the literature needs further studies in which each dimension of financial literacy is considered as an independent construct. Moreover, Basha et al. (2023) use national scores of financial literacy, while financial literacy within countries is subject to high sub-population variations (Lusardi and Mitchell, 2014). Therefore, the nascent literature investigating how financial literacy influences SMEs' leverage would benefit from having individual-level measures of financial literacy.

In this study, we address those two gaps, by investigating how the *Big Three* dimensions of financial literacy influence SMEs' leverage. For each dimension, we draw several hypotheses. First, we suggest that the understanding of how compound interests might develop entrepreneurs' use of debt. We suggest that entrepreneurs with a higher understanding of compound interests should identify more often that internal financing has an opportunity cost and would prefer to use debt (H1). We expect compound interests understanding to have a positive effect on long-term debt usage (H2a) and a negative effect on short-term debt (H2b). Risk understanding is another dimension of financial literacy and might be associated with the precautionary behaviors of entrepreneurs. Entrepreneurs tend to perceive entrepreneurial activities as less risky than they are. Thus, entrepreneurs who understand more risk and risk

diversification should be more able to accurately perceive the risk of entrepreneurial activities, among which bankruptcy risk is the costliest. We expect then to find a negative relationship between risk understanding and SMEs' leverage (H3). Bates et al. (2009) argue that such precautionary motives are a key determinant of SMEs' cash holdings, sometimes to an excessive extent. We suggest then that entrepreneurs who understand more accurately risk might become more cautious, leading them to hold higher amounts of cash (H4a). Finally, we assume that entrepreneurs with a higher understanding of how inflation works might prefer investing their cash in projects with rates of return above the rate of return of saving accounts and marketable securities. Entrepreneurs with a higher understanding of how inflation works should therefore have a lower level of cash (H4b).

We test those hypotheses using a sample of French SMEs. We use the AMADEUS database from Bureau Van Dijk to gather the financial information of French SMEs. We cross the financial data (2014-2023) to a survey we designed, which was sent to entrepreneurs in 2022. We obtain a sample of 1,761 firm-year observations. We use as dependent variables various measures of leverages, alternatively long-term and short-term leverages. We also use two cash management measures: the ratio of cash holdings to total assets of SMEs, and the amount of industry-adjusted cash holdings for SMEs. We use as independent variables the *Big Three* dimensions of financial literacy (Interest, Inflation, Risk) as the independent variables. We use OLS estimations, with firm-clustered standard errors.

The results show that understanding compound interests has a positive influence on SMEs' level of long-term leverage. Thus, the results of this study contribute to the literature in several ways. From a theoretical perspective, we highlight that financial literacy influences SMEs leverage through one specific channel: long-term planning and preference for long-term financial products. From an empirical perspective, this study is the first to use individual-level data, which provides a more fine-grained analysis of the relationship between financial literacy and SMEs' leverage. Finally, this paper bears a practical contribution. We show that practitioners should consider financial literacy as a tool to improve SMEs' access to debt financing. Practitioners should specifically increase entrepreneurs' ability to understand how compound interests work.

In the next section, we present the literature review supporting this study. In the third section, we present the hypotheses of this study. Section 4 presents the methods and Section 5

presents the results. In Section 6 we conduct robustness checks. Section 7 discusses the results and Section 8 concludes.

2. Literature Review

2.1. Theoretical Background

Modigliani and Miller's (1958) theorem is the milestone of capital structures theories, which posits that the capital structure of firms does not influence firms' total value, if markets are perfect. Their work establishes that financial decisions only create value by addressing market imperfections. Modigliani and Miller (1963) introduced tax imperfections within their model. Modigliani and Miller (1963) demonstrate that a levered firm's value is equal to the value of a non-levered firm, adding the present value of the tax-deductible interest.

Building on Modigliani and Miller (1963), the trade-off theory (Kraus and Litzenberger, 1973) posits that as the leverage of firms increases, the risk of bankruptcy and the costs associated with it also increase. To a given extent, the cost of financial distress overcomes the interest tax shield. Therefore, there exists an optimal capital structure, where the interest of tax shield is high but at the same time, bankruptcy costs remain low. Ross (1977) argues that debt can be used by firms as a positive signal. Ross (1977) posits that if the bankruptcy costs are sufficiently high, high-quality firms prefer to issue debt since they know that they are highly profitable and less risky for debtors. Low-quality firms prefer to issue equity since bankruptcy costs are high. Therefore, Ross (1977) highlighted the agency benefit of debt, since debt issuance can be used to reduce the asymmetry of information between firm owners and lenders.

Jensen and Meckling's (1976) agency theory also studies the relationship between firm owners and debtors. The authors argue that the interests of equity holders (firm owners) and debtors differ in project selection. For a given level of debt granted, equity holders have the choice to select a risky or safe project. Riskier projects yield higher returns, which are captured by equity holders in the form of dividends. However, if the project fails, debtors who have financed the project bear the consequences. Therefore, equity holders may invest in riskier projects, but debtors anticipate this behavior and raise the cost of debt. In the end, Jensen and Meckling (1976) suggest that these opposing interests, agency cost of debt, between equity holders and debtors decrease the value of debt (i.e. the leverage). Moreover, issuing debt can discipline managers in small firms and prevent them from overinvesting. Jensen (1986) argues

that debt disciplines managers of large firms by forcing them to pay out excess cash thereby reducing the amount of funds under their discretion. Lopez-Garcia and Mestre-Barbera (2015) provide evidence that the disciplinary effect of debt on managers also occurs in SMEs.

However, several criticisms were addressed to the trade-off theories. Miller (1977) for instance argued that the trade-off theories give bankruptcy costs an overestimated weight in the bankruptcy costs-interest tax shield balance. Indeed, Miller (1977) highlights that bankruptcy is a rare event, with low dead-weight costs. Thus, if trade-off models were accurate, firms should display a higher level of leverage than observed. The criticisms of the trade-off theories lead Myers and Majluf (1984) to develop the pecking order theory.

Myers and Majluf (1984) argue that adverse selection increases the cost of financing, which makes firms' owners favor internal financing rather than any external source of financing. As a firm grows, internal financing becomes insufficient to support firm development, which pushes firms' owners to choose between debt or equity financing. Myers and Majluf (1984) therefore posit in the pecking order theory, that firms first use internal financing and second, external financing. In a second step, Myers and Majluf (1984) argue that firm owners decide to use debt financing or equity financing, depending on their private information about their firm. If they estimate that the market value of their firm is underestimated, they prefer to use debt. If they estimate that the market value of their firm is overestimated, they will use equity. According to Myers and Majluf (1984), there is no optimal capital structure, which contradicts the trade-off theory (Kraus and Litzenberger, 1973). Myers and Majluf (1984) rather suggest that financing decisions follow the following pecking order: internal funds at first, debt, and then equity financing.

Baker and Wurgler's (2002) market timing theory overcomes the opposition between equity and debt issuance and proposes a model where managers' attempts to time market changes influence a firm's capital structure. Managers and firm owners issue equity when they believe that the cost of issuance is irrationally low and repurchase equity when the costs of issuance are irrationally high. The market timing theory assumes that managers believe they can time market changes but does not need to assume that the predictions of managers are successful. According to Baker and Wurgler (2002), there is no optimal capital structure, and firms' capital structure is the result of the past managers' attempts to time the market changes.

2.2.Determinants of capital structure

In addition to the large theoretical literature on capital structure choices, we describe the country-level determinants of capital structure. Then we discuss the firm-level determinants and finally, we present the entrepreneur-level determinants of capital structure.

2.2.1.   Country-level determinants

The financial development of countries influences the capital structure of firms (Beck et al., 2006, Beck and Demirgürç-Kunt, 2006). Financial development allows existing firms to exploit growth and investment opportunities to achieve larger equilibrium size. Indeed, in countries with higher financial development, SMEs face fewer financing obstacles (Beck et al., 2006). SMEs in countries with higher financial developments are more attractive to lenders and thus have facilitated access to external finance. The legal environment, as it can protect investors, is another country-specific determinant of firms' leverage. In countries with legal environments that favor investors' ability to recover debts, banks have more incentive to grant loans to firms, as they have more institutional backup in case of firms' bankruptcy (La Porta et al., 1997). Back-up can either take the form of institutional dedicated funds to compensate for bank losses or facilitated access to repayment procedures. La Porta et al. (1997) compare the legal environment of 49 countries and observe that countries with a common law legal environment protect more external investors, which in turn increases national firms' leverage. For instance, the US, the UK, South Africa, Australia, and Canada are countries with common law legal environments. Beck et al. (2005) observe that the civil law legal environment increases financing obstacles for SMEs, reducing access to external finance. Daskalakis et al. (2017) show that the financial development and economic environment influence SMEs' capital structure. Using cross-country data, Daskalakis et al. (2017) observe that in countries with more developed financial institutions and more favorable macro-economic conditions (e.g. higher GDP, lower inflation), SMEs have facilitated access to external finance and have increased leverage. Wang et al. (2023), using cross-country data provide empirical confirmations that the legal environment (i.e. English legal environment) and financial development of countries have a positive effect on SMEs' access to external finance.

Countries' culture also influences firms' leverage in two ways. First national cultures are intertwined with countries' financial (Kwok and Tadesse, 2006) and legal (La Porta et al., 1998) developments. Second, national cultures influence how individuals perceive debt. In

cultures in which debt is perceived as a burden, people tend to avoid using debt financing. In cultures where individuals consider debt and equity as means to do business, people are prone to put effort into paying their loans and ask for external financing (Chui et al., 2002). In cultures where debt is negatively framed, firm owners are more reluctant to apply for loans, which decreases firms' leverage (Chui et al., 2002). Chui et al. (2016) investigate how the traits of national cultures affect firms' capital structure. They find that in countries in which conservatism is dominant, firms tend to rely less on debt financing. Similarly, national cultures that promote self-commitment and individual performance negatively influence firms' leverage. Basha et al (2023b), using a larger sample of countries, also observe that national cultural traits such as conservatism are related to SME's leverage.

There is a debate in the literature on to what extent country-level determinants affect firms' leverage. Gungoraydinoglu and Öztekin (2011) highlight the importance of country-level determinants of capital structure, as they show that one-third of leverage's variations are caused by country characteristics. Moreover, Gungoraydinoglu and Öztekin (2011) show that the effect of firm-specific determinants on a firm's leverage is partially mediated by countries. However, Hall et al. (2004) and Psillaki and Daskalakis (2009) show that differences in leverages across countries are due to firm-specific characteristics rather than country-specific characteristics. Jõeveer (2013a) finds that firm-specific determinants explain a higher part of the variance of SMEs' leverage than country-specific determinants. Psillaki and Daskalakis (2009) using SMEs from France, Greece, Italy, and Portugal, also observe that SMEs in those countries tend to follow Myers and Majluf's (1984) pecking order theory when choosing financing sources. Overall, both streams of literature show that firm-level determinants have a major effect on firms' leverage, which explains why firm-level determinants represent a large stream of the overall literature on the determinants of leverage. We present thereafter the firm-level determinants of capital structure.

2.2.2. Firm-level determinants

Extensive investigations have been conducted to investigate the relationship between firms' characteristics and firms' capital structure. Among the various firm-level determinants of capital structure identified by the literature, the most commonly investigated determinants are presented thereafter.

The industry of the firm influences the SMEs' leverage. SMEs within a given industry share a similar pattern of business risk since they propose similar products, have similar costs of skilled labor and materials, and use similar technologies. Therefore, industries in which the business risk is higher tend to have lower leverage than safer industries (Ferri and Jones, 1979). Moreover, SMEs in a given industry tend to use the industry's averages as targets and consider the average leverage as a target (Frank et Goyal, 2009). This can be explained by the fact that SMEs have limited benchmarks. Furthermore, Hall et al. (2000) argue that SMEs in a given industry have a similar asset structure and therefore a similar need for financing. Empirical findings support the assumption that the industry influences SMEs' capital structure, (Andrieu et al., 2018; Mac an Bhaird and Lucey 2010; Degryse et al. 2012). Jõeveer (2013b) finds that industry explains more the variations in SMEs' leverages for larger SMEs.

Many studies outline that firm size is a determinant of capital structure (Titman and Wessels, 1988). Small size is likely to worsen the information asymmetry between the entrepreneur and potential capital lenders (Berger and Udell, 1998; 2006). As a result, the cost of debt may be higher for SMEs than for large firms (Titman and Wessels, 1988). On the other hand, bankruptcy costs are relatively higher for small companies because large firms show more stability. This situation supports a positive relationship between firm size and total and long-term debt and a negative one between size and short-term debt. These results signify that large firms usually choose long-term debt, while small companies prefer short-term (Michaelas et al., 1999; Hall et al., 2004).

Firms' age and firms' lifecycle are related to leverage as potential agency problems are not constant over the life cycle of the firm. Firms at the start-up stage typically experience the greatest informational opacity problems and may not have access to debt financing. As a firm becomes established and develops a trading and credit history, reputation effects alleviate the problem of moral hazard, facilitating borrowing capacity. On the contrary, as firms age, they have a greater ability to generate internal resources, and thus, their need for external finance may decline. Michaelas et al. (1999), Hall et al. (2004), Mac an Bhaird and Lucey (2010) provide empirical confirmation of the negative relationship between SMEs' age and leverage.

Collateral also determines firms' capital structure, as it reduces agency problems between firm owners and lenders (Berger and Udell, 1990; 1998). Indeed, the primary concern for outside contributors of capital arises from moral hazard, or the possibility of the SME owner changing his behavior to the detriment of the capital provider after credit has been granted

(Jensen and Meckling, 1976). This is because the firm owner has the incentive to alter his behavior ex-post to favor projects with higher returns and greater risk. Debt providers seek to minimize agency costs arising from these relationships by employing a number of lending techniques, among which collateralized assets are of great use (Berger and Udell, 1990). Berger and Udell (1998) moreover observe that the use of collateral is more developed within young firms since they have shorter and weaker relationships with banks. The structure of assets is another determinant of a firm's capital structure, related to collateral. Assets tangibility is related to a firm's capacity to offer collaterals (Titman and Wessels, 1988), which can be used to reduce the risk of lending for banks. The literature identifies collaterals as a well-developed instrument of signaling for SMEs (Imronudin and Hussain, 2016; Cowling et al., 2016; Deakins and Hussain, 1994; Fletcher, 1995). SMEs that cannot meet collateral requirements face limited access to finance (Love et al., 2016).

One dimension of ownership structure that may affect capital structure choice is family ownership structure. Family-led businesses are more reluctant to rely on equity financing than debt financing since it means a dilution of the capital of the firms for future generations (Gonzalez et al., 2013). Therefore, family-led SMEs are more prone to use debt to finance their growth than equity. Exceptions are older entrepreneurs who lack familial successors and are prepared to accept non-family participants as possible successors

Based on Myers and Majluf's (1984) pecking order theory, Titman and Wessels (1988) argue that firms' profitability is an important determinant of capital structure since it represents a source of internal funding for firms. Fama and French (2002) compare the effect of profitability on firms' leverage, from both a pecking order and a trade-off perspective. Fama and French (2002) suggest that in a pecking order model, we should observe a negative relationship between profitability and leverage: higher profitability increases the internal funds of the firm, which prefers to use those internal funds over debt and equity. In turn, Fama and French (2002) posit that in a trade-off model, profitability is positively associated with leverage as high profitability reduces bankruptcy risk and therefore reduces bankruptcy costs. Firms with higher profitability then may have less costly access to loans, and thus, more profitable firms should have higher leverage. Hall et al. (2004) show that profitability is negatively associated with SMEs' leverage, for both the long term and the short term.

In addition, Titman and Wessels (1988) argue that the volatility of the profitability determines a firm's leverage. A number of studies have indicated an inverse relationship

between the volatility of profitability and debt (Bradley et al., 1984; Titman and Wessels, 1988; Friend and Lang, 1988; MacKie-Mason, 1990; Kale et al., 1991). Other studies suggest a positive relationship (Jordan et al., 1998; Michaelas et al., 1999). Paulo Esperança et al. (2003) also found positive associations between SMEs' volatility of profitability and both long-term and short-term debt.

Firm growth creates demand for investment funds. In this situation, internal funds are often insufficient to power the growth process, and entrepreneurs have to consider alternative sources of funding. Pecking order theory predicts that short-term debt represents the first financing option, followed by long-term leverage. Michaelas et al. (1999) found a positive relationship between growth, and short- and long-term leverage. Overall, high-growth firms will take on more debt than less-performing firms, which suggests a positive relationship between growth and leverage..

Pieces of literature investigate how entrepreneurs' characteristics influence the capital structure of the SMEs they own and lead. In the case of SME finance, the entrepreneurs are the main deciding party, and therefore, their characteristics influence their willingness to use debt as a source of financing. Moreover, some personal characteristics of entrepreneurs also determine their chance of success to get loans granted. In the following section, we present the entrepreneurs' characteristics that influence the capital structure of SMEs.

2.2.3. Entrepreneur-level determinants

The gender of entrepreneurs affects the capital structure of their firm since female entrepreneurs have different aspirations than male entrepreneurs (Verheul and Thurik 2001). Female entrepreneurs tend to work in industries, such as the service industry, that require lower start-up investment, limiting the need for external financing. Moreover, female entrepreneurs tend to run smaller firms, which thus have lower needs in terms of growth sustainability or activity financing (Verheul and Thurik, 2001). Furthermore, female entrepreneurs spend less time networking, which in the end lowers their ability to negotiate credit lines at more advantageous costs (Verheul and Thurik, 2001). Finally, the gender of entrepreneurs affects SME's leverage through discrimination mechanisms. Female-led businesses have to pay higher interest rates, which discourages them from applying for loans. Moreover, women anticipate rejection and therefore apply less for loans. Cowling et al. (2020) show that women-led SMEs apply less for loans but are more likely to obtain funding after the application. However, Ewens

(2023) points out that females tend to have more difficult access to credit, despite being not different from male entrepreneurs.

The age of entrepreneurs is negatively associated with the use of external financing and the use of debt (Van der Wijst, 1988). As entrepreneurs age, their willingness to operate high growth for their firm is lowered. Therefore, aging entrepreneurs lose the incentive to search for external sources of financing.

Besides the socio-demographic traits of entrepreneurs, some psychological traits influence entrepreneurs' willingness to use debt financing. Psychological traits affect how entrepreneurs perceive debt and bankruptcy costs and therefore, influence their willingness to rely on debt or on alternative sources of financing.

Risk aversion of entrepreneurs is associated with higher debt. Indeed, risk-averse entrepreneurs have incentives to finance projects with debt, since issuing debt involves sharing the risk of failure between entrepreneurs and lenders. Therefore, the more risk-averse entrepreneurs are, the more they are willing to share the risk of a project with lenders. Similarly, the riskier projects are, the more risk-averse entrepreneurs are willing to issue debt, to dilute their personal risk.

Entrepreneurs' level of confidence also determines which capital structure choices they undertake. According to Malmendier and Tate (2005), if entrepreneurs are overconfident, they believe that firm shares are valued under the market value, which opens the mispricing problem. In such circumstances where the cost of capital is not properly defined, errors are possible in decisions about the viability of investment projects. Because of the belief that stocks are underpriced, the entrepreneur will select the issue of debt as a source of financing for projects, rather than equity financing. A recent study by Cole et al. (2022) however argues that there is an optimal level of overconfidence, where entrepreneurs maximize their chance to obtain loans. A higher level of overconfidence signals to lenders that entrepreneurs spend more effort to succeed in their projects, which makes more overconfident entrepreneurs more attractive to lenders. On the contrary, a higher overconfidence is associated with a higher probability of failure for entrepreneurs, since they mistakenly estimate the risks of the project they undertake. Thus, overconfidence also increases the risk of bankruptcy, which is less attractive to lenders. Therefore, there is according to Cole et al. (2022) an optimal level of overconfidence in which the additional efforts spent by overconfident entrepreneurs outweigh the potential bankruptcy risks.

Finally, entrepreneurs' backgrounds influence the capital structure of SMEs. The general educational background has been first identified as a determinant of SMEs' leverage. Recent pieces of literature observe that financial educational background also influences the capital structure of SMEs.

The educational background of the entrepreneur is positively related to debt, implying that higher-educated owners do have greater possibilities of borrowing. Higher-educated owners are more able to present a plausible case to external investors, including banks. Overall, the level of education appears to have an important positive impact SMEs' debt-raising capacities (Irwin and Scott, 2010). Besides entrepreneurs' general education, nascent literature investigates how specific forms of education can influence firms' capital structure. The financial education of individuals has been largely studied in relationship with personal investment and financial decisions (Goyal and Kumar, 2021).

Although the financial education of entrepreneurs remains an understudied determinant of firms' capital structure, a stream of literature investigates how the financial practices of entrepreneurs influence firms' capital structure.

2.2.4. Financial practices and capital structure

Financial practices serve entrepreneurs as a signaling tool for external investors. Entrepreneurs who develop more financial practices appear to potential investors as more trustworthy. The positive signal comes from higher efforts put into the development of baseline financial practices, such as the preparation of financial documents (Hussain et al., 2018), or keeping cash (Abebe et al., 2018; Cherotich et al., 2019; Pahlevi et al., 2020; Sayinzoga et al., 2016). Entrepreneurs with more developed financial practices gain bargaining power over lenders, and thus obtain more often loans, at a lower cost. The relationship between financial practices and firms' access to debt financing has been observed in both developed countries (Hussain et al., 2018) and developing countries (Addo and Asante, 2022; Buchdadi et al., 2020; Frimpong et al., 2022; Korutaro et al., 2013; Okello et al., 2017).

The financial practices of entrepreneurs also influence their preference for debt, internal funds, or equity. Entrepreneurs who pay more attention to finance tend to develop a stronger preference for long-term financing and avoid high-cost borrowings (Nitani et al., 2020). Among long-term sources of finance, entrepreneurs with enhanced interest in finance and with more developed financial practices prefer debt over equity (Grana-Alvarez et al., 2022; Nohong et

al., 2019; Koropp et al., 2013). Overall, entrepreneurs with developed financial practices seem to follow a pecking order decision-making process, since they prefer first to rely on internal financing (Diptyana et al., 2022).

The nascent literature on the effects of financial practices on capital structure often frames financial practices as "financial knowledge" and even more often as "financial literacy". Chen and Volpe (1998) measure financial practices as the frequency with which individuals search and use financial information, using different sources (reading the news, watching TV, using specialized journals). Hussain et al. (2018) add to these items, subjective declarations of entrepreneurs, regarding their use of financial statements, their use of financial information, and their understanding of how to financially manage their business. For instance, the measures of financial practice include questions such as "How often do you establish the financial documents of your company?" or "Do you read finance-specialized newspapers?"

2.2.5. From financial practice to financial education and capital structure

Fernandes et al. (2014) and Hastings et al. (2013) find that the causal relationship between the financial literacy of individuals and their financial practices might be weak since they observe that in many studies, the financial literacy of individuals explains little to no variance of individuals' financial practices. On the contrary, Lusardi and Mitchell (2014), Mitchell and Lusardi (2015), and Lusardi and Mitchell (2023) observe a strong causal relationship between financial literacy and financial behaviors, with financial literacy influencing individuals personal finance decisions. Mitchell and Lusardi (2015) argue that studies that do not observe a causal effect of financial literacy on financial behaviors differ enormously in terms of their approach and empirical rigor, type of intervention, and tests conducted. Lusardi and Mitchell (2014, 2023) show that financial literacy needs to be measured through the *Big Three* (Lusardi and Mitchell, 2014) and related methods. The *Big Three* refers to the three questions of financial literacy, respectively measuring people's understanding of how compound interests, work, how inflation works, and what risk and risk diversification are (Lusardi and Mitchell, 2008). In an entrepreneurial context, the arguments of Mitchell and Lusardi (2015) suggest that framing financial practice as "financial literacy" or "financial knowledge" might be inappropriate, since those financial practices may result from entrepreneurs' actual knowledge. Therefore, there is a need in the entrepreneurship literature to

use the *Big Three* questions of financial literacy and investigate how they influence entrepreneurs' financial behaviors.

Basha et al. (2023) study is to our knowledge, the first that uses a measure of objective financial literacy applied to the issue of SMEs' capital structure. Basha et al. (2023) observe that financial literacy has a negative effect on firms' leverage. The authors define firms' leverage as the total level of liabilities over the total equities and liabilities of firms. Basha et al. (2023) conducted a country-level analysis, using the average score of financial literacy across 22 countries.

However, this study uses countries' average scores of financial literacy. This might be an issue since the level of financial literacy varies across national populations (Lusardi and Mitchell, 2014). Some sub-populations for instance display a low level of financial literacy, such as women (Lusardi and Mitchell, 2008). Moreover, Lusardi and Mitchell (2014) show that the relationship between age and the level of financial literacy of individuals follows an inverted U-shaped curve. Younger and older people have a lower level of financial literacy than middle-aged individuals. Thus, the literature would benefit from a more fine-grained analysis of the relationship between financial literacy and SMEs' capital structure, by using individual-level data. It would be then possible to account for sub-populations differences in financial literacy. Furthermore, the measure designed by Lusardi and Mitchell (2008) specifically distinguishes several dimensions of financial literacy (interest, inflation, and risk understanding). Basha et al. (2023) use a measure of financial literacy that aggregates people's knowledge regarding each dimension. Lusardi and Mitchell (2014) however argue that for each dimension of financial literacy, individuals have to master different competencies. For instance, understanding how compound interests work involves for individuals to have well-developed numeracy. Numeracy is the ability of individuals to use mathematical concepts and execute mathematical computations (Lusardi and Mitchell, 2014). This competence is essential for understanding how compound interest works but is not involved in the development of the understanding of risk and risk diversification (Lusardi and Mitchell, 2008). Therefore, there is a need in the SMEs' financing literature to use each dimension of financial literacy separately in empirical designs.

From a theoretical perspective, using separately the three dimensions of financial literacy as potential determinants of SMEs' leverage remains an unexplored issue. We suggest that each dimension of financial literacy, as it involves different core competencies, could produce different effects on SMEs' leverage. From an empirical perspective, the literature on

the relationship between financial literacy and SMEs' capital structure lacks individual-level investigations. Moreover, this nascent literature do not use the *Big Three* financial literacy questions (Lusardi and Mitchell, 2014) which are considered as the most stable measures of financial literacy (Mitchell and Lusardi, 2015).

3. Hypotheses development

We draw hypotheses on the relationship between financial literacy and capital structure, using each dimension of financial literacy separately. Financial literacy is the knowledge of individuals regarding baseline financial concepts (Lusardi and Mitchell, 2008) and is composed of three dimensions.

The first dimension of financial literacy is the understanding of how compound interest works. This dimension is related to individuals' ability to use mathematical tools and to do mathematical calculations (Lusardi and Mitchell, 2008, 2014). Therefore, entrepreneurs with a higher understanding of compound interest might be more able to understand that debt offers a tax-deductible advantage and should be able to have a more accurate estimation of tax-deductible interests. Thus, entrepreneurs with a higher understanding of compound interests should identify more often that internal financing has an opportunity cost. Those entrepreneurs should thus understand that raising debt could be advantageous for financing projects and thus, we expect a positive relationship between the understanding of compound interests and SMEs' leverage.

H1: The understanding of compound interest is positively related to leverage.

Moreover, Lahav et al. (2015) show that individuals with a higher financial literacy are more likely to engage in long-term financial behaviors and to establish long-term planning (Lusardi and Mitchell, 2011). Several authors observe that financial literacy is associated with more patience and a preference for long-term planning (Wagner and Walstad, 2019; Meier and Sprenger, 2013; Mudzingiri et al. 2018). Thus, entrepreneurs who have a higher understanding of compound interest might prefer to have long-term planning and thus prefer to have long-term investment plans. Thus, entrepreneurs with a higher understanding of compound interest might use more long-term leverage, since they fit more with long-term investment plans. We expect thus that the understanding of compound interest is positively influencing entrepreneurs' use of long-term loans. On the contrary, the understanding of compound interest might be

negatively influencing the use of short-term loans, since financially literate entrepreneurs prefer to use long-term financial instruments.

H2a: The understanding of compound interest is positively related to long-term leverage.

H2b: The understanding of compound interest is negatively related to short-term leverage.

Another dimension of financial literacy is the understanding of what is risk and risk diversification. This dimension of financial literacy increases the ability of individuals to perceive the risks of given financial products and investment projects (Lusardi and Mitchell, 2008). Indeed, as they have a more accurate understanding of what represents the risk of undertaking a project in terms of potential losses, individuals are more able to accurately identify the level of risk of investment projects. Therefore, financial literacy might increase entrepreneurs' ability to perceive risk accurately. Entrepreneurs tend to misperceive the risk attached to their project (Moskowitz and Vissing Jorgensen, 2002, Astebro et al., 2014), which causes them to ask for returns that do not compensate for the risks they undertake. Cooper et al (1988) observe that people underestimate the risks related to entrepreneurial activities. One risk that entrepreneurs face when they are indebted is the bankruptcy risk. Therefore, an entrepreneur with higher financial literacy might have a more accurate perception of the risk of going bankrupt, since financial literacy has an overall positive effect on risk understanding. Facing the real risk of going bankrupt, entrepreneurs with higher financial literacy might be more prone to first rely on internal funds to avoid bankruptcy risk.

H3: The understanding of risk and risk diversification is negatively related to leverage

The understanding of risk and risk diversification may also increase entrepreneurs' precautionary savings practices. Bates et al. (2009) argue that precautionary motives explain why firms tend to hold high amounts of cash. Anticipating adverse shocks, firms hold cash to avoid financial distress. Sitkin and Weingart (1995) argue that when entrepreneurs have a more accurate risk perception, they tend to undertake less risky decisions. Therefore, following the precautionary motive of Bates et al. (2009), entrepreneurs with a higher understanding of risk and risk diversification might be more precautionary than other entrepreneurs. Because they have a more accurate understanding of entrepreneurial risks, entrepreneurs with a higher financial literacy might have higher cash holdings in their SMEs.

H4a: The understanding of risk and risk diversification is related to higher cash holdings

The last dimension of financial literacy is the understanding of how inflation works. This dimension of financial literacy develops among individuals the ability to understand the time-value of money (Lusardi and Mitchell, 2008). Individuals with a higher understanding of the mechanism of inflation understand more that keeping money on investment projects with returns below the inflation rate represents a loss. Moreover, the financial literacy of individuals makes them more proactive in their financing decisions, fostering their participation in stock markets (Van Rooij et al., 2012). People with higher financial literacy tend to pay more attention and spend more effort in selecting investment projects (Allgood and Walstad, 2016). Thus, entrepreneurs with higher financial literacy should understand that holding cash and marketable securities represents an opportunity cost since cash and marketable yield a lower return than most investment decisions. Entrepreneurs with a higher understanding of how inflation works should thus prefer investing their cash in projects with rates of return above the rate of return of saving accounts and marketable securities. Entrepreneurs with a higher understanding of how inflation works should therefore have a lower level of cash in their SMEs.

H4b: The understanding of how inflation works is related to lower cash holdings

4. Method

4.1. Sample

We administer a survey to entrepreneurs who possess one or several French businesses. The survey period lasts from March 2022 to the end of December 2022. To select entrepreneurs, we use the AMADEUS database, from Bureau Van Dijk. We select French businesses, for which an e-mail address is available on AMADEUS. We focus on privately held standalone firms, meaning that we exclude from the sample firms affiliated with business groups as well as firms listed on public equity markets and holdings. Then, we keep businesses that have between 10 and 250 employees. We select businesses that do not exceed 50 million euros of annual sales and with maximal total assets worth 43 million euros. The sales and total assets criteria are used by French law to define SMEs and thus are commonly used in the literature on SMEs to identify relevant entrepreneurs. The selection process led to a pool of 95,243 entrepreneurs we contacted by email, asking them to answer the survey. In the survey, we use

a filter question to identify entrepreneurs who are actively managing their businesses. In the end, 1,208 entrepreneurs answered the survey.

Complementary to the survey, we use the AMADEUS database to gather the financial information of entrepreneurs' businesses. Using AMADEUS, we gather ten years of financial information on businesses, from 2014 to 2023. In both the survey we send to entrepreneurs and the AMADEUS database, we use the French national identification number (SIREN) of companies to identify entrepreneurs. Using the SIREN, the answers to the survey and the financial information of businesses are matched[21]. Overall, after checking for incomplete answers and missing values, the final sample for this study is made of 383 French firms that represent 1,761 firm-year observations.

4.2. Variables

4.2.1. Dependent variable

The literature on the determinants of SME's capital structure distinguishes between several types of leverage (Hall et al., 2004; Psillaki and Daskalakis, 2009; Rajan and Zingales, 1995). First, Rajan and Zingales (1995) define leverage as the total amount of debt over the total equities and liabilities. To test our hypotheses on the effect of financial literacy on SMEs' leverage, we use then several measures of firms' leverage. First, we calculate the *Total Leverage* for each firm:

$$Total\ Leverage = \frac{Long\ term\ loans + Other\ long\ term\ debts + Short\ term\ loans + Other\ short\ term\ debts}{Total\ equities\ and\ liabilities}$$

Then, following Hall et al. (2004), we distinguish between long-term and short-term leverages. Long-term leverage (*LT Leverage*) is calculated as:

$$LT\ Leverage = \frac{Long\ term\ loans + Other\ long\ term\ debt}{Total\ equities\ and\ liabilities}$$

We also calculate the short-term leverage (Hall et al., 2004) of firms as so:

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[21] To ensure the anonymity of respondents, the matching has been operated by a third party, that is not involved in any other step of this research. The third person used the SIREN numbers to match survey and AMADEUS databases, delete the SIREN information from the merged database and then send only the merged database back.

$$ST\ Leverage = \frac{Short\ term\ loans + Payables + Other\ short\ term\ debt}{Total\ equities\ and\ liabilities}$$

The *Cash Ratio* is widely used in the literature as a measure of cash management (Gao et al., 2013; Maheswari and Rao, 2017). We use the *Cash Ratio* to measure the level of cash within SMEs. We use *Cash Ratio* to test our hypotheses on the relationship between financial literacy and cash management. Following Maheswari and Rao, (2017) we calculate:

$$Cash\ Ratio = \frac{Cash + Marketable\ securties}{Total\ Assets}$$

Finally, we use an alternative measure of cash holdings, which accounts for industries' differences in cash holding. We thus create an industry-adjusted measure of cash holdings (*I.A Cash Ratio*) which is calculated by subtracting the median cash ratio of the industry from the SMEs' cash ratio (Gao et al., 2013).

4.2.2. Independent variables

The financial literacy of individuals is the independent variable of the different models in this study. Students are administered the *Big Three* financial literacy questions, from the seminal work of Lusardi and Mitchell (2014). The measure of financial literacy implies considering three factors that are determinants for the financial literacy of individuals. The first factor that is measured is the ability to understand compound interest. We measure *FL Interest* asking students how much there would be in a hypothetical savings account, with an interest rate of 2%, after letting on this account 100€ for 5 years. Students had the choice between, *'Less than 102€'*, *'More than 102€'*, *'Exactly 102€'*, or *'I don't know'*. The correct answer is *'More than 102€'*. The second factor captured is the ability to understand inflation, *FL Inflation*. We ask students what they could buy using a hypothetical savings account with 100€ on it, with an interest rate of 2% and an inflation rate of 3%. The possible responses are *'Less than today'*, *'Exactly the same as today'*, *'More than today'*, and *'I don't know'*. The correct answer is *'Less than today'*. The last factor defining baseline financial literacy is the understanding of risk and risk diversification, *FL Risk*. The measure is a true or false question, asking respondents if investing in a single stock company would provide a safer return than investing in a mutual fund. The correct answer is *'False'*. For each question, a score of 0 is assigned to those who

wrongly answer or who don't know the answer and 1 for those who correctly answer the question.

4.2.3. Control variables

As we focus solely on French firms, we cannot use as control variables the country-level determinants of SMEs' leverage. We focus on firm-level and entrepreneur-level determinants of SMEs' capital structure.

Starting with firm-level determinants, we first use as a control the assets structure of firms. The asset structure has a negative impact on firms' leverage since firms with a higher proportion of tangible assets have lower leverage (Psillaki and Daskalakis, 2009). Thus, we create a variable *Assets Tangibility* by dividing the amount of total tangible assets of each firm by their total assets. A firm's size is associated with the firm's diversification strategy (Titman and Wessels, 1988) and the firm's age (Berger and Udell, 1998). Therefore, the firm size can have either a positive or negative effect on a firm's leverage. We use the natural logarithm of the total asset to calculate the *Size* variable. Profitability is also a negative or positive determinant of firms' leverage. Therefore, we use the return on assets (*ROA*) as a measure of firms' profitability (Hall et al., 2004). Hall et al. (2004) also observe that the age and growth of firms negatively influence their leverage. Therefore, we create a variable *Age Business* by subtracting the date of creation of each firm from 2022 (the year of the survey). We create a variable *Var Sales* to measure the growth of firms. *Var Sales* is calculated as the annual variation of sales for each firm, scaled by the firm's total assets. Finally, we control the industry of the firm, as SMEs in the same industry are likely to have similar leverage (Mac an Bhaird and Lucey 2010; Degryse et al. 2012). We set dummies for differentiating between industries within the primary, secondary, and tertiary sectors, using the primary codes of the NACE REV2 classification.

We also control for entrepreneurs' characteristics that affect SMEs' leverage. Entrepreneurs' gender is expected to have a negative effect on firms' leverage, for female entrepreneurs (Verheul and Thurik, 2001). We create a dummy *Gender* equal to 1 if the entrepreneur is a female and equal to 0 if the entrepreneur is a male. Finally, we control for the educational background of entrepreneurs, as more educated entrepreneurs tend to use more debt (Irwin and Scott, 2010). We use a categorical variable *Degree*, with 8 categories, to capture entrepreneurs' educational backgrounds.

Finally, since our data regroups information of companies for several years, we add years dummies (from 2014 to 2023) in the models we use. Table 2.1 summarizes the definitions of the variables used in the different models.

Table 2. 1 Definition of the variables

Variables	Measure	Use in the model	Type of variable	Source
Total Leverage	Total debts (short-term and long-term) over total equities and liabilities	Dependent variable	Continuous	Hall et al. (2004)
LT Leverage	Long-term debts (financial and non-financial) over total equities and liabilities	Dependent variable	Continuous	Hall et al. (2004)
ST Leverage	Short-term debts (financial and non-financial) over total equities and liabilities	Dependent variable	Continuous	Hall et al. (2004)
Cash Ratio	Cash+Marketable securities over total assets	Dependent variable	Continuous	Maheswari and Rao (2017)
I.A. Cash Ratio	Firm's cash ratio-Industry median cash ratio	Dependent variable	Continuous	Gao et al. (2013)
FL Interest	Understanding of how compound interests work: =0 if wrong or "I don't know" =1 if right	Independent variable	Dummy	Lusardi and Mitchell (2014)
FL Inflation	Understanding of how inflation works: =0 if wrong or "I don't know" =1 if right	Independent variable	Dummy	Lusardi and Mitchell (2014)
FL Risk	Understanding of what risk and risk diversification are =0 if wrong or "I don't know" =1 if right	Independent variable	Dummy	Lusardi and Mitchell (2014)
Assets Tangibility	Tangible assets over total assets	Control variable	Continuous	Psillaki and Daskalakis (2009)
Var Sales	Annual variations of sales over total assets	Control variable	Continuous	Hall et al. (2004)
ROA	Net earnings over total assets	Control variable	Continuous	Hall et al. (2004)
Size	Log of the total assets	Control variable	Continuous	Hall et al. (2004)
Age Business	2022-Creation date of firms	Control variable	Categorical	Hall et al. (2004)
Gender	=0 if male =1 if female	Control variable	Dummy	Verheul and Thurik (2001)
Degree	=1 if Less than a High School degree =2 if High School degree or equivalent =3 if Technical degree =4 if Bachelor's degree =5 if First Year Master's degree =6 if Completed Master's degree =7 if Ph.D. or equivalent	Control variable	Categorical	Irwin and Scott (2010, adapted)
Industry dummies	One dummy for the primary sector, one dummy for the secondary sector, one dummy for the tertiary sector	Control variable	Dummy	Mac an Bhaird and Lucey (2010, adapted)

5. Results

Table 2.2 reports the descriptive statistics. Panel A reports the descriptive statistics for the time-invariant variables and Panel B reports the descriptive statistics for the firm-year observations.

Table 2. 2 Descriptive statistics

Panel A: Time-invariant variables

Variables	N	Mean	SD	Median	Min	Max
FL Interest	383	0.9739	0.1597	1	0	1
FL Inflation	383	0.9556	0.2062	1	0	1
FL Risk	383	0.8329	0.3736	1	0	1
Age Business	383	26.9321	14.6060	24	2	96
Gender:						
Male	383	0.7990	0.4013	1	0	1
Female	383	0.2010	0.3993	0	0	1
Degree:						
Less than High School Degree	383	0.0706	0.2563	0	0	1
High School Degree or equivalent	383	0.0444	0.2062	0	0	1
Technical Degree	383	0.1697	0.3759	0	0	1
Bachelor Degree or equivalent	383	0.0835	0.2771	0	0	1
First year Master or equivalent	383	0.1227	0.3285	0	0	1
Master Degree or equivalent	383	0.4282	0.4955	0	0	1
Ph.D. or equivalent	383	0.0809	0.2731	0	0	1

Panel B: Time-variant variables

Variables	N	Mean	SD	Median	Min	Max
Total Leverage	1,761	0.5755	0.2710	0.5547	0.0533	2.8564
LT Leverage	1,761	0.0996	0.1550	0.048	0	2.3502
ST Leverage	1,761	0.4759	0.2309	0.4482	-0.0566	2.2536
Cash Ratio	1,725	0.2556	0.2135	0.2067	0.00002	0.9602
I.A.Cash Ratio	1,725	-0.1404	1.4797	0.0000	-0.2251	0.8930
Assets Tangibility	1,761	0.1083	0.1386	0.0592	0	0.9514
Var Sales	1,761	0.0002	0.0031	0.00001	-0.0216	0.1037
ROA	1,761	0.0541	0.1186	0.0532	-2.1618	0.6421
Size	1,761	7.2738	1.2174	7.2437	1.6601	10.5181

The main insight provided by the descriptive statistics is that entrepreneurs in this sample have a high level of financial literacy. Indeed, a large majority of them correctly answer the three financial literacy questions. Although the question on interest is the easiest one to answer, even for the general population (Lusardi and Mitchell, 2014), the proportion of 97.39% of correct answers in the sample is far above the general population, worldwide (Lusardi and Mitchell, 2014) or French (Arrondel, 2017). The decreases in correct answers for the question on inflation, and the question on risk and risk diversification follow the general tendency (Lusardi and Mitchell, 2014), with the question on risk being the hardest one. However, the rate of correct answers is still higher for the sampled entrepreneurs than for the general population. Moreover, Wise (2013) argues that entrepreneurs generally lack financial literacy. This might be due to the fact that entrepreneurs in this sample have an overall high level of education since 60% of them have at least a first-year master's degree. Again, the positive relationship between education and financial literacy (Lusardi and Mitchell, 2014) might explain why the sampled entrepreneurs perform well in terms of financial literacy. Finally, as entrepreneurs in this sample are mainly male (79.90%), they display a higher level of financial literacy. Indeed, females tend to display a lower level of financial literacy than males (Lusardi and Mitchell, 2008).

Regarding SMEs' characteristics, SMEs in this sample are more indebted than other French SMEs' sample (Benkraiem and Gurau; 2013, Psillaki and Daskalakis, 2009) Benkanem and Gurau observe in their sample an average leverage of 0.359 and Psilakia and Daskalaikis (2009) an average leverage of 0.5278 for French SMEs. SMEs in the present studies use on average more short-term debt and less long-term debt than French SMEs in other samples Benkraiem and Gurau (2013). Compared to more recent statistics from the Bulletin de la Banque de France (Bureau and Py, 2023), SMEs in this sample still are more leveraged than the average French SMEs in 2022. However, they are similar in terms of size and profitability. Compared to the sample of Benkraiem and Gurau (2013) SMEs in this sample have on average less tangible assets. Overall, SMEs in this sample are similar to other samples of French SMEs in terms of performance (size, profitability), but differ in terms of capital structure (leverage) and asset structure.

5.1.Testing the influence of financial literacy on firms' leverage

To investigate how financial literacy influences firms' leverage, we first test the influence of each dimension of financial literacy (*FL Interest*, *FL Inflation*, *FL Risk*) on firms' *Total Leverage.* As *Total Leverage* is a continuous variable, we use ordinary least squares (OLS) models with firm-clustered standard errors. Table 2.3 reports the coefficients of the OLS models.

Table 2. 3 The effect of financial literacy on total leverage

Table 2.3 reports the coefficient for the OLS estimation of the effect of financial literacy on total leverage. The first model tests the effect of *FL Interest* on total leverage, the second model tests the effect of *FL Inflation* on total leverage and the third model tests the effect of *FL Risk* on total leverage. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns.

Firm-clustered standard errors in parentheses (383 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
				Total Leverage				
Independent variables:								
FL Interest	0.0807						0.0799	
	(0.0634)						(0.0636)	
FL Inflation			-0.0247				-0.0294	
			(0.0531)				(0.0514)	
FL Risk					0.0267		0.0254	
					(0.0323)		(0.0324)	
Controls:								
Assets Tangibility	0.2663	***	0.2683	***	0.2732	***	0.2663	***
	(0.0855)		(0.0854)		(0.0817)		(0.0822)	
Var Sales	4.3975	***	4.4667	***	4.4493	***	4.4355	***
	(0.9059)		(0.9100)		(0.9062)		(0.9037)	
ROA	-0.4948	***	-0.5006	***	-0.4953	***	-0.4911	***
	(0.0811)		(0.0816)		(0.0819)		(0.0812)	
Size	0.0101		0.0104		0.0093		0.0094	
	(0.0121)		(0.0122)		(0.0120)		(0.0120)	
Age Business	-0.0020	**	-0.0020	**	-0.0020	**	-0.0020	**
	(0.0009)		(0.0009)		(0.0009)		(0.0009)	
Gender	-0.0204		-0.0270		-0.0233		-0.0212	
	(0.0294)		(0.0290)		(0.0288)		(0.0292)	
Constant	0.4062	***	0.5031	***	0.4611	***	0.4173	***
	(0.1174)		(0.1075)		(0.1029)		(0.1254)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,761		1,761		1,761		1,761	
F Stat	5.61	***	5.62	***	5.79	***	5.44	***
Adjusted R²	0.1383		0.1364		0.1377		0.1397	
R²	0.1491		0.1472		0.1485		0.1514	

We observe that financial literacy does not influence firms' total leverage. Indeed, we do not find significant coefficients for *FL Interest*, *FL inflation*, or *FL Risk* in Model 1, Model 2, Model 3, and Model 4. We suggest that *Total Leverage*, as it takes into account both short-term and long-term debts, financial and non-financial debt, does not provide sufficiently detailed insights on SMEs' leverage management. We suggest that on one hand, entrepreneurs' understanding of compound interest could increase the long-term leverage of SMEs. On the other hand, we hypothesize that the understanding of compound interests might lower the short-term leverage of SMEs. Thus, the absence of a significant relationship between *FL Interest* and *Total Leverage* might be due to the opposing effects of *FL Interest* on *LT Leverage* and *ST Leverage*.

Regarding control variables, we observe that asset tangibility is associated with higher *Total Leverage*, which is consistent with previous studies (Titman and Wessels, 1989). We also observe that profitability is associated with lower leverage, which is consistent with prior empirical investigations on SMEs (Fama and French, 2002). The literature highlights that SMEs follow a pecking order theory scheme when choosing their source of finance and thus, profitability is used as retained earnings to increase internal finance (Fama and French, 2002). Similarly, we observe a negative relationship between *Total Leverage* and firms' *Age*. This is consistent with prior studies (Michaelas et al., 1999; Hall et al., 2004; Mac an Bhaird and Lucey, 2010).

To investigate how financial literacy influences the use of long-term and short-term leverages in SMEs, we use *LT Leverage* and *ST Leverage* to measure the preference of entrepreneurs for long-term or short-term external financing. We use OLS estimations with firm-clustered standard errors. We add industries and year dummies. In Table 2.4, we report the coefficient of the models, which test the effects of *FL Interest*, *FL Inflation*, and *FL Risk* on *LT Leverage* and *ST Leverage*.

Table 2. 4 The effect of financial literacy on long-term and short-term leverage
Table 2.4 reports the coefficient for the OLS estimation of the effect of financial literacy on long-term leverage (*LT Leverage*) and short-term leverage (*ST Leverage*). The first model tests the effect of *FL Interest* on *LT Leverage*, the second model tests the effect of *FL Inflation* on *LT Leverage,* and the third model tests the effect of *FL Risk* on *LT Leverage*. In Model 4, the three dimensions of financial literacy are tested altogether. The fifth model tests the effect of *FL Interest* on *ST Leverage*, the sixth model tests the effect of *FL Inflation* on *ST Leverage,* and the seventh model tests the effect of *FL Risk* on *ST Leverage*. In Model 8, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns.
Firm-clustered standard errors in parentheses (383 clusters); *** p<0.001, **p<0.05, *p<0.1

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	LT Leverage								ST Leverage							
FL Interest	0.0347	*					0.0316	*	0.0444						0.0469	
	(0.0184)						(0.0191)		(0.0578)						(0.0594)	
FL Inflation			0.0092				0.0071				-0.0283				-0.0306	
			(0.0221)				(0.0221)				(0.0471)				(0.0462)	
FL Risk					0.0168		0.0159						0.0048		0.0043	
					(0.0156)		(0.0157)						(0.0282)		(0.0282)	
Assets Tangibility	0.2232	***	0.2258	***	0.2267	***	0.2256	***	0.0481		0.0479		0.0509		0.0457	
	(0.0680)		(0.0682)		(0.0657)		(0.0661)		(0.0796)		(0.0800)		(0.0793)		(0.0805)	
Var Sales	1.3391	**	1.3486	**	1.3630	**	1.3383	**	3.0015	***	3.0545	***	3.0271	***	3.0326	***
	(0.5804)		(0.5818)		(0.5663)		(0.5694)		(0.7731)		(0.7758)		(0.7758)		(0.7758)	

Continued on next page

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
ROA	-0.1472	***	-0.1492	***	-0.1464	***	-0.1444	***	-0.4322	***	-0.4356	***	-0.4341	***	-0.4320	***
	(0.0440)		(0.0441)		(0.0441)		(0.0439)		(0.0679)		(0.0681)		(0.0686)		(0.0683)	
Size	0.0016		0.0016		0.0011		0.0010		0.0044		0.0046		0.0043		0.0044	
	(0.0092)		(0.0092)		(0.0093)		(0.0093)		(0.0104)		(0.0104)		(0.0103)		(0.0103)	
Age Business	-0.0011	***	-0.0011	***	-0.0011	***	-0.0011	***	-0.0009		-0.0009		-0.0009		-0.0009	
	(0.0004)		(0.0004)		(0.0004)		(0.0004)		(0.0008)		(0.0008)		(0.0008)		(0.0008)	
Gender	-0.0136		-0.0148		-0.0145		-0.0122		-0.0082		-0.0130		-0.0104		-0.0103	
	(0.0122)		(0.0124)		(0.0121)		(0.0124)		(0.0270)		(0.0261)		(0.0264)		(0.0267)	
Constant	0.0476		0.0704		0.0676		0.0327		0.3966	***	0.4639	***	0.4336	***	0.4203	***
	(0.0657)		(0.0656)		(0.0647)		(0.0628)		(0.1071)		(0.0972)		(0.0929)		(0.1166)	
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
N=	1,761		1,761		1,761		1,761		1,761		1,761		1,761		1,761	
F Stat	7.21	***	7.10	***	7.29	***	6.90	***	4.91	***	4.91	***	4.91	***	4.54	***
Adjusted R²	0.1406		0.1396		0.1413		0.1416		0.0824		0.0824		0.0817		0.0824	
R²	0.1514		0.1503		0.1521		0.1533		0.0939		0.0939		0.0932		0.0949	

Table 2.4 continued

We observe that the understanding of compound interests (*FL Interest*) has a significant and positive effect on the firm's long-term leverage. This effect is found when we test this dimension of financial literacy separately in Model 1 (β=0.0347, $p<0.1$) and with the other dimension of financial literacy in Model 4 (β=0.0316, $p<0.1$). We do not find a significant effect of any dimension of financial literacy on the short-term leverage of firms. Results in Tables 2.3 and 2.4 partially support hypothesis H1, which assumes that financial literacy has a positive influence on SMEs' leverage. We observe that one dimension, the understanding of compound interests working has a positive influence on SMEs' leverage. This hypothesis is only partially supported since we find a significant influence only for long-term leverage. This result supports hypothesis H2a which suggests that the understanding of how compound interests work has a positive influence on the long-term leverage of SMEs. However, results cannot support hypothesis H2b, as we do not find any significant relationship between financial literacy and short-term leverage. Finally, H3 which supposes that the understanding of risk and risk diversification is negatively related to leverage, is not supported.

5.2. Testing the influence of financial literacy on cash management

To test hypotheses, H4a and H4b, which respectively assume that financial literacy can have a positive or a negative effect on SMEs' cash holdings, we use the variable *Cash Ratio* to assess the level of cash within firms. Alternatively, we use *I.A. Cash* as an industry-adjusted measure of cash holdings. We first test the effect of *FL Interest*, *FL Inflation*, and *FL Risk* on *Cash Ratio*. We use OLS estimations with firm-clustered standard errors. We add industries and year dummies to each model. Table 2.5 reports the coefficient of the OLS estimations.

Table 2. 5 The effect of financial literacy on cash holdings

Table 2.5 reports the coefficient for the OLS estimation of the effect of financial literacy on cash management (*Cash Ratio*). The first model tests the effect of *FL Interest* on the *Cash Ratio*, the second model tests the effect of *FL Inflation* on the *Cash Ratio,* and the third model tests the effect of *FL Risk* on the *Cash Ratio*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns. In Table 2.5, we use 1,725 observations because of missing variables for *Cash Ratio*.

Firm-clustered standard errors in parentheses (382 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
					Cash Ratio			
Independent variables:								
FL Interest	-0.0802						-0.0750	
	(0.0651)						(0.0618)	
FL Inflation			-0.0349				-0.0310	
			(0.0455)				(0.0432)	
FL Risk					-0.0157		-0.0135	
					(0.0295)		(0.0294)	
Controls:								
Assets Tangibility	-0.3016	***	-0.3091	***	-0.3074	***	-0.3060	***
	(0.0509)		(0.0503)		(0.0503)		(0.0506)	
Var Sales	-0.4107		-0.4174		-0.4655		-0.3811	
	(1.1639)		(1.1687)		(1.1587)		(1.1724)	
ROA	0.4000	***	0.4043	***	0.4022	***	0.3971	***
	(0.0827)		(0.0833)		(0.0833)		(0.0830)	
Size	-0.0152		-0.0151		-0.0148		-0.0145	
	(0.0094)		(0.0094)		(0.0095)		(0.0095)	
Age Business	0.0001		0.00003		0.00003		0.00005	
	(0.0007)		(0.0007)		(0.0007)		(0.0007)	
Gender	0.0345		0.0362		0.0381		0.0314	
	(0.0301)		(0.0298)		(0.0297)		(0.0304)	
Constant	0.4175	***	0.3778	***	0.3555	***	0.4511	***
	(0.1082)		(0.1006)		(0.0925)		(0.1183)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N	1,725		1,725		1,725		1,725	
F Stat	9.12	***	9.11	***	9.08	***	8.59	***
Adjusted R²	0.1621		0.1606		0.1601		0.1626	
R²	0.1728		0.1713		0.1708		0.1743	

We test in Models 1,2, and 3 the effects of each dimension of financial literacy on SMEs' cash holdings separately. In Model 4, we add the three dimensions of financial literacy in a single model. We do not observe a significant effect of financial literacy on SMEs' cash management. Thus, Hypotheses H4a and H4b are not supported.

In Table 2.5, we observe that the tangibility of assets has a positive influence on SMEs' cash holdings, which is consistent with previous findings (Uyar and Kuzey, 2014). We do not find a significant relationship between cash holdings and SMEs' size, which is contrary to existing literature (Opler et al., 1999; Bigelli and Sanchez-Vidal, 2012). We do not also find any significant relationship between cash holdings and the growth of SMEs, which is contrary to the existing literature (Garcia-Teruel and Martinez-Solano, 2008).

Finally, we use as an alternative measure of cash holdings the industry-adjusted measure of cash holdings *(I.A. Cash Ratio)*. We use as the independent variables the three dimensions of financial literacy *FL Interest*, *FL Inflation*, and *FL Risk*. We use OLS estimations, with firm-clustered standard errors. First, we test the effect of each dimension of financial literacy (*FL Interest*, *FL Inflation*, and *FL Risk*) on the *I.A. Cash Ratio*. Then in Model 4, we test the effect of the three dimensions of financial literacy on the *I.A. Cash Ratio* in a single regression. Results are reported in Table 2.6. We observe that none of the three dimensions of financial literacy has an influence on SMES' cash holdings, which is consistent with the results in Table 2.5.

Table 2. 6 The effect of financial literacy on industry-adjusted cash holdings

Table 2.6 reports the coefficient for the OLS estimation of the effect of financial literacy on industry-adjusted cash holdings of SMEs (*I.A. Cash Ratio*). The first model tests the effect of *FL Interest* on *I.A. Cash Ratio*, the second model tests the effect of *FL Inflation* on *I.A. Cash Ratio* and the third model tests the effect of *FL Risk* on *I.A. Cash Ratio*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns. In Table 2.6, we use 1,725 observations because of missing variables for *I.A. Cash Ratio*.

Firm-clustered standard errors in parentheses (382 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
				I.A. Cash Ratio				
Independent variables:								
FL Interest	-0.1783						-0.1477	
	(0.1585)						(0.1433)	
FL Inflation			-0.1348				-0.1229	
			(0.1470)				(0.1439)	
FL Risk					-0.1266		-0.1212	
					(0.1334)		(0.1324)	
Controls:								
Assets Tangibility	-0.0325		-0.0544		-0.0545		-0.0572	
	(0.1696)		(0.1628)		(0.1686)		(0.1653)	
Var Sales	22.9199		22.9745		22.7648		23.0066	
	(25.6457)		(25.6641)		(25.5773)		(25.6485)	
ROA	0.6926		0.7007		0.6809		0.6696	
	(0.4486)		(0.4481)		(0.4551)		(0.4567)	
Size	0.5275	***	0.5281	***	0.5319	***	0.5328	***
	(0.1664)		(0.1666)		(0.1698)		(0.1701)	
Age Business	-0.0008		-0.0010		-0.0010		-0.0010	
	(0.0022)		(0.0022)		(0.0022)		(0.0022)	
Gender	0.0405		0.0396		0.0429		0.0247	
	(0.0724)		(0.0711)		(0.0716)		(0.0727)	
Constant	-3.4027	***	-3.4371	***	-3.4788	***	-3.2330	***
	(1.1247)		(1.1170)		(1.0902)		(1.0416)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,725		1,725		1,725		1,725	
F Stat	2.52	***	2.50	***	2.50	***	2.35	***
Adjusted R²	0.2451		0.2453		0.2461		0.2460	
R²	0.2548		0.2549		0.2557		0.2565	

Overall, results suggest that entrepreneurs' ability to calculate and understand compound interest helps them to have a more accurate valuation of the cost of external financing. Entrepreneurs with higher financial literacy rely more on long-term loans. However, the results of this study show that the financial literacy of entrepreneurs does not influence their cash management.

6. Robustness checks

One issue regarding the data of this study is that we mix panel data and longitudinal data. We have one period for the measure of financial literacy of individuals, and we cross this single-period measure to ten years of SMEs' financial data. By doing so, we assume that the level of financial literacy of entrepreneurs is a given, constant, variable. This strong assumption however brings some limits to the results of this study since the financial literacy of entrepreneurs measured in 2022 might not explain the capital structure of SMEs before 2022. Holding financial literacy constant moreover is quite problematic since past studies observe variations of financial literacy over individuals' lifecycles (Lusardi and Mitchell, 2014). Therefore, testing the relationship between financial literacy and the leverages for 2022 (the year of the financial literacy survey) would be the most suitable solution. However, we suffer from a large number of missing variables due to the data collection process of Bureau Van Dijk[22].

Thus, we create an alternative measure of leverage, using the mean leverages of the SMEs over the period (2014-2023). We therefore calculate *Mean Total Leverage*, *Mean LT Leverage*, and *Mean ST Leverage* respectively as the mean total debts, long-term debts, and short-term debts, divided by the mean total assets of the SMEs. Similarly, we use the *Mean Cash Ratio* calculated as the mean cash holdings over the period divided by the mean total assets. Finally, we use the mean industry-adjusted cash ratio (*Mean I.A. Cash Ratio*) of each SME over the period, as an alternative measure of *I.A. Cash Ratio*. We use the same three dimensions of financial literacy as in the main results: the understanding of how compound interests work, how inflation works, and what is risk and risk diversification. We use as

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[22] Due to a large number of missing variables, we conducted the analyses for year 2022 with 155 SMEs, compared to 383 for the main results. Therefore, this drop of 40.47% of our sample might partially explain why we do not observe significant results. This large number of missing variables is due to the poor information available for the year 2022 on AMADEUS database. We suggest that we would be able to gather more complete data in future years, when the 2022 financial information of the sampled SMEs will be more accessible to Bureau Van Dijk.

dependent variables *Total Leverage*, *LT Leverage*, *ST Leverage*, and *Cash Ratio* as for the main results. We keep the same control variables (*Assets Tangibility*, *Var Sales*, *ROA*, *Size*, *Age Business*, and *Gender*). For the time-variant variables (*Assets Tangibility*, *Var Sales*, *ROA*, *Size*, *Age Business*), we use the mean value of each variable. Since we only focus on the year 2022, we do not use year dummies, and we use standard errors instead of clustered standard errors. We keep the industry's dummies. Table 2.7 reports the coefficients with *Total Leverage* as the dependent variable. Table 2.8 reports the coefficients with *LT Leverage* and *ST Leverage* as the dependent variables and Table 2.9 reports the coefficients with *Mean Cash Ratio* as the dependent variable. Table 2.10 reports the coefficient with *Mean I.A. Cash Ratio* as the dependent variable.

Table 2. 7 The effect of financial literacy on the mean total leverage (2014-2023)

Table 2.7 reports the coefficient for the OLS estimation of the effect of financial literacy on the mean total leverage for the period 2014-2023. The first model tests the effect of *FL Interest* on total leverage, the second model tests the effect of *FL Inflation* on total leverage and the third model tests the effect of *FL Risk* on total leverage. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). As they are time-variant variables, we use for each the mean value over the period. We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include year and industry dummies. We do not report the coefficients for *Degree*, year and industry dummies for visibility concerns.

Standard errors in parentheses; *** p<0.001, **p<0.05, *p<0.1

	(1)		(2)		(3)		(4)	
	Total Leverage (mean)							
Independent variables:								
FL Interest	0.0880						0.0847	
	(0.0629)						(0.0622)	
FL Inflation			-0.0082				-0.0134	
			(0.0555)				(0.0538)	
FL Risk					0.0329		0.0312	
					(0.0373)		(0.0374)	
Controls:								
Assets Tangibility (mean)	0.2830	***	0.2869	***	0.2910	***	0.2851	***
	(0.1006)		(0.1008)		(0.0967)		(0.0978)	
Var Sales (mean)	2.7278	***	2.7840	***	2.7853	***	2.7525	***
	(0.9344)		(0.9312)		(0.9116)		(0.9145)	
ROA (mean)	-0.4378	***	-0.4436	***	-0.4377	***	-0.4329	***
	(0.0827)		(0.0827)		(0.0833)		(0.0832)	
Size (mean)	-0.0021		-0.0019		-0.0031		-0.0031	
	(0.0175)		(0.0175)		(0.0175)		(0.0175)	
Age Business (mean)	-0.0019	**	-0.0018	**	-0.0018	*	-0.0018	**
	(0.0009)		(0.0009)		(0.0009)		(0.0009)	
Gender	-0.0249		-0.0306		-0.0278		-0.0242	
	(0.0313)		(0.0307)		(0.0306)		(0.0310)	
Constant	0.4723	***	0.5602	***	0.5297	***	0.4665	***
	(0.1420)		(0.1318)		(0.1276)		(0.1432)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,761		1,761		1,761		1,761	
F Stat	5.61	***	5.62	***	5.79	***	5.44	***
Adjusted R²	0.1383		0.1364		0.1377		0.1397	
R²	0.1491		0.1472		0.1485		0.1514	

Table 2. 8 The effect of financial literacy on the mean long-term and short-term leverage (2014-2023)

Table 2.8 reports the coefficient for the OLS estimation of the effect of financial literacy on the mean long-term leverage (*LT Leverage*) and short-term leverage (*ST Leverage*) for the 2014-2023 period. The first model tests the effect of *FL Interest* on *LT Leverage*, the second model tests the effect of *FL Inflation* on *LT Leverage,* and the third model tests the effect of *FL Risk* on *LT Leverage*. In Model 4, the three dimensions of financial literacy are tested altogether. The fifth model tests the effect of *FL Interest* on *ST Leverage*, the sixth model tests the effect of *FL Inflation* on *ST Leverage,* and the seventh model tests the effect of *FL Risk* on *ST Leverage*. In Model 8, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). For each variable, we use the mean value over the period. We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include year and industry dummies. We do not report the coefficients for *Degree* and year and industry dummies for visibility concerns.

Standard errors in parentheses; *** p<0.001, **p<0.05, *p<0.1

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	LT Leverage (mean)								ST Leverage (mean)							
FL Interest	0.0446	**					0.0407	**	0.0435						0.0440	
	(0.0179)						(0.0182)		(0.0565)						(0.0573)	
FL Inflation			0.0108				0.0081				-0.0190				-0.0215	
			(0.0237)				(0.0235)				(0.0489)				(0.0481)	
FL Risk					0.0210		0.0200						0.0118		0.0112	
					(0.0184)		(0.0184)						(0.0290)		(0.0290)	
Assets Tangibility (mean)	0.1906	***	0.1940	***	0.1951	***	0.1936	***	0.0924		0.0930		0.0959		0.0916	
	(0.0600)		(0.0602)		(0.0573)		(0.0576)		(0.0888)		(0.0892)		(0.0882)		(0.0896)	

Var Sales (mean)	-0.6477		-0.6345		-0.6173		-0.6480		3.3755	***	3.4186	***	3.4026	***	3.4004	***
	(0.8749)		(0.8752)		(0.8603)		(0.8676)		(0.6077)		(0.6057)		(0.6059)		(0.6021)	
ROA (mean)	-0.0744		-0.0770		-0.0736		-0.0710		-0.3634	***	-0.3666	***	-0.3641	***	-0.3619	***
	(0.0542)		(0.0542)		(0.0551)		(0.0550)		(0.0636)		(0.0635)		(0.0636)		(0.0635)	
Size (mean)	-0.0040		-0.0040		-0.0047		-0.0047		0.0019		0.0021		0.0015		0.0016	
	(0.0141)		(0.0141)		(0.0143)		(0.0144)		(0.0111)		(0.0111)		(0.0110)		(0.0110)	
Age Business (mean)	-0.0011	***	-0.0011	***	-0.0011	***	-0.0011	***	-0.0007		-0.0007		-0.0007		-0.0007	
	(0.0004)		(0.0004)		(0.0004)		(0.0004)		(0.0008)		(0.0008)		(0.0008)		(0.0008)	
Gender	-0.0135		-0.0151		-0.0146		-0.0117		-0.0115		-0.0155		-0.0132		-0.0125	
	(0.0128)		(0.0130)		(0.0128)		(0.0131)		(0.0277)		(0.0267)		(0.0270)		(0.0272)	
Constant	0.0919		0.1222		0.1179		0.0739		0.3804	***	0.4380	***	0.4118	***	0.3926	***
	(0.0927)		(0.0928)		(0.0904)		(0.0859)		(0.1093)		(0.0984)		(0.0947)		(0.1163)	
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
N=	1,761		1,761		1,761		1,761		1,761		1,761		1,761		1,761	
F Stat	4.55	***	4.30	***	4.44	***	4.46	***	4.85	***	4.85	***	4.91	***	454	***
Adjusted R²	0.1049		0.1029		0.1060		0.1071		0.0742		0.0737		0.0738		0.0740	
R²	0.1160		0.1141		0.1171		0.1193		0.0858		0.0853		0.0853		0.0866	

Table 2.8 continued

117

Table 2. 9 The effect of financial literacy on the mean cash holdings (2014-2023)

Table 2.9 reports the coefficient for the OLS estimation of the effect of financial literacy on cash management (*Cash Ratio*) for the 2014-2023 period. The first model tests the effect of *FL Interest* on the *Cash Ratio*, the second model tests the effect of *FL Inflation* on the *Cash Ratio,* and the third model tests the effect of *FL Risk* on the *Cash Ratio*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We use the mean values of each variable over the period. We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include industry and year dummies. We do not report the coefficient for *Degree* and year and industry dummies for visibility concerns. In Table 2.9, we use 1,725 observations because of missing variables for *I.A. Cash Ratio*.

Standard errors in parentheses; *** p<0.001, **p<0.05, *p<0.1

	(1)		(2)		(3)		(4)	
	Cash Ratio (mean)							
Independent variables:								
FL Interest	-0.0840						-0.0784	
	(0.0627)						(0.0594)	
FL Inflation			-0.0347				-0.0305	
			(0.0454)				(0.0430)	
FL Risk					-0.0183		-0.0160	
					(0.0298)		(0.0298)	
Controls:								
Assets Tangibility (mean)	-0.2501	***	-0.2576	***	-0.2564	***	-0.2547	***
	(0.0527)		(0.0521)		(0.0523)		(0.0525)	
Var Sales (mean)	0.2267		0.2164		0.1754		0.2499	
	(1.0541)		(1.0584)		(1.0552)		(1.0616)	
ROA (mean)	0.3053	***	0.3098	***	0.3074	***	0.3021	***
	(0.0678)		(0.0685)		(0.0683)		(0.0680)	
Size (mean)	-0.0166	*	-0.0165	*	-0.0161	*	-0.0159	*
	(0.0092)		(0.0093)		(0.0092)		(0.0093)	
Age Business (mean)	0.0001		0.0000		0.0000		0.0001	
	(0.0007)		(0.0007)		(0.0007)		(0.0007)	
Gender	0.0353		0.0373		0.0389		0.0321	
	(0.0301)		(0.0299)		(0.0298)		(0.0305)	
Constant	0.4268	***	0.3833	***	0.3630	***	0.4617	***
	(0.1050)		(0.0983)		(0.0910)		(0.1152)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,725		1,725		1,725		1,725	
F Stat	5.61	***	5.61	***	5.58	***	5.25	***
Adjusted R²	0.1478		0.1458		0.1454		0.1489	
R²	0.1585		0.1564		0.1561		0.1605	

Table 2. 10 The effect of financial literacy on the mean industry-adjusted cash holdings (2014-2023)

Table 2.10 reports the coefficient for the OLS estimation of the effect of financial literacy on the mean industry-adjusted cash holdings of SMEs (*I.A. Cash Ratio*). The first model tests the effect of *FL Interest* on the mean *I.A. Cash Ratio*, the second model tests the effect of *FL Inflation* on the mean *I.A. Cash Ratio*, and the third model tests the effect of *FL Risk* on the mean *I.A. Cash Ratio*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). For the time-variant variables, we use the mean value over the 2014-2023 period. We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns. In Table 2.10, we use 1,725 observations because of missing variables for *I.A. Cash Ratio*.

Standard errors in parentheses; *** p<0.001, **p<0.05, *p<0.1

	(1)		(2)		(3)		(4)	
	I.A. Cash Ratio (mean)							
Independent variables:								
FL Interest	-0.2025						-0.1709	
	(0.1618)						(0.1469)	
FL Inflation			-0.1348				-0.1214	
			(0.1455)				(0.1423)	
FL Risk					-0.1303		-0.1243	
					(0.1346)		(0.1338)	
Controls:								
Assets Tangibility	-0.0980		-0.1207		-0.1219		-0.1230	
	(0.1650)		(0.1589)		(0.1642)		(0.1611)	
Var Sales	1.9755		2.0031		1.8256		2.0445	
	(11.8819)		(11.8950)		(11.8498)		(11.8950)	
ROA	0.0242		0.0339		0.0143		0.0016	
	(0.4600)		(0.4588)		(0.4736)		(0.4756)	
Size	0.5062	***	0.5066	***	0.5104	***	0.5112	***
	(0.1542)		(0.1544)		(0.1574)		(0.1577)	
Age Business	-0.0005		-0.0006		-0.0007		-0.0007	
	(0.0022)		(0.0023)		(0.0022)		(0.0023)	
Gender	0.0702		0.0706		0.0734		0.0542	
	(0.0745)		(0.0733)		(0.0733)		(0.0746)	
Constant	-3.1038	***	-3.1600	***	-3.1979	***	-2.9313	***
	(1.0062)		(1.0023)		(0.9744)		(0.9273)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,725		1,725		1,725		1,725	
F Stat	3.01	***	2.98	***	2.99	***	2.79	***
Adjusted R²	0.2736		0.2736		0.2746		0.2748	
R²	0.2826		0.2827		0.2837		0.2846	

We observe in Table 2.8 that *FL Interest* has a significant and positive influence on *LT Leverage*, which is consistent with previous results. *FL Interest* is the only dimension of financial literacy that affects SMEs' leverage, which is also consistent with the main findings. In Table 9, we do not observe a significant relationship between the *Mean Cash Ratio* and any dimension of financial literacy, which is also consistent with the main results. Finally, we observe in Table 2.10 that financial literacy has no significant effect on *Mean I.A. Cash Ratio*, which confirms the results found in Table 2.6.

Next, we would like to mention that despite the measures of leverage and cash holdings are used in a large corpus of studies (Hall et al. 2004; Maheswari and Rao, 2017), alternative measures are worth mentioning. In the study, we assume that the financial literacy of entrepreneurs may have an effect on their financial behaviors, which in the end would have an impact on the capital structure of their SMEs. However, we use as dependent variables different leverages, in which non-financial elements can be found. For instance, for the *LT Leverage*, we include long-term debts that are non-financial. In the measure of short-term leverage we use, we include both short-term loans and payables. Financial literacy might be related to short-term financial decisions of entrepreneurs, and thus might affect the use of short-term loans, but is less related to the use of payables. Therefore, we propose to use them as alternative measures of leverage, with loans as the measure of SMEs' indebtedness. We calculate the total financial leverage (*Fin Leverage*) as:

$$Fin\ Leverage = \frac{Long\ term\ loans + Short\ term\ loans}{Total\ equities\ and\ liabilities}$$

In Table 2.11, we report the coefficients with *Fin Leverage* as the dependent variable. We observe that *FL Interest* in Model 1 has a significant and positive effect on *Fin Leverage* ($\beta=0.0552$; $p<0.05$), as for in Model 4 ($\beta=0.0497$; $p<0.05$) This result, in line with the main results of this study, confirms that the financial literacy is more related to the financial leverage of SMEs than to the global level of indebtedness of SMEs.

Table 2. 11 The effect of financial literacy on financial leverage

Table 2.11 reports the coefficient for the OLS estimation of the effect of financial literacy on financial leverage. The first model tests the effect of *FL Interest* on financial leverage, the second model tests the effect of *FL Inflation* on financial leverage and the third model tests the effect of *FL Risk* on financial leverage. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns.

Firm-clustered standard errors in parentheses (383 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
				Fin Leverage				
Independent variables:								
FL Interest	0.0552	**					0.0497	**
	(0.0219)						(0.0227)	
FL Inflation			0.0319				0.0290	
			(0.0246)				(0.0248)	
FL Risk					0.0179		0.0163	
					(0.0214)		(0.0215)	
Controls:								
Assets Tangibility	0.2784	***	0.2842	***	0.2831	***	0.2829	***
	(0.0765)		(0.0772)		(0.0744)		(0.0753)	
Var Sales	3.7852		3.7826		3.8205		3.7634	
	(3.6589)		(3.6587)		(3.6469)		(3.6560)	
ROA	-0.2537	***	-0.2564	***	-0.2540	***	-0.2505	***
	(0.0639)		(0.0644)		(0.0641)		(0.0638)	
Size	0.0054		0.0053		0.0048		0.0047	
	(0.0155)		(0.0155)		(0.0157)		(0.0157)	
Age Business	-0.0011	**	-0.0011	**	-0.0011	**	-0.0011	**
	(0.0005)		(0.0005)		(0.0005)		(0.0005)	
Gender	-0.0159		-0.0164		-0.0179		-0.0128	
	(0.0168)		(0.0168)		(0.0166)		(0.0168)	
Constant	0.0322		0.0520		0.0699		-0.0017	
	(0.1113)		(0.1129)		(0.1089)		(0.1079)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,761		1,761		1,761		1,761	
F Stat	6.24	***	5.70	***	5.84	***	5.85	***
Adjusted R²	0.1307		0.1297		0.1296		0.1312	
R²	0.1409		0.1406		0.1404		0.1431	

Ozkan and Ozkan (2004) use an alternative measure of cash holdings, where cash and equivalents are divided by the total liabilities minus cash and equivalents. Applying this to our data, we calculate:

$$Cash\ Ratio\ 2 = \frac{Cash\ and\ Marketable\ Securities}{Total\ equities\ and\ liabilities - Cash\ and\ marketable\ Securities}$$

Then, we test the effect of financial literacy on *Cash Ratio 2* and report the coefficients in Table 2.12. We observe that the results of Table 2.12 are similar to what we observe in previous tables, as we do not find a significant relationship between the financial literacy of entrepreneurs and the level of cash holdings of their SMEs.

Table 2. 12 The effect of financial literacy on alternative cash ratio

Table 2.12 reports the coefficient for the OLS estimation of the effect of financial literacy on an alternative measure of cash holdings (*Cash Ratio 2*), equal to the cash and marketable securities divided by total equities and liabilities minus cash and marketable securities (Ozkan and Ozkan, 2004). The first model tests the effect of *FL Interest* on *Cash Ratio 2*, the second model tests the effect of *FL Inflation* on *Cash Ratio 2* and the third model tests the effect of *FL Risk* on *Cash Ratio 2*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns. In Table 2.12, we use 1,725 observations because of missing variables for *Cash Ratio*.

Firm-clustered standard errors in parentheses (382 clusters); *** p<0.001, **p<0.05, *p<0.1

	(1)		(2)		(3)		(4)	
					Cash Ratio 2			
Independent variables:								
FL Interest	-0.3586						-0.3354	
	(0.5041)						(0.4688)	
FL Inflation			-0.1011				-0.0821	
			(0.2435)				(0.2138)	
FL Risk					-0.1087		-0.0998	
					(0.1402)		(0.1343)	
Controls:								
Assets Tangibility	-1.1638	***	-1.1924	***	-1.1938	***	-1.1823	***
	(0.2620)		(0.2606)		(0.2548)		(0.2553)	
Var Sales	-7.8969		-7.9937		-8.1560		-7.8476	
	(7.6911)		(7.7085)		(7.7311)		(7.7217)	
ROA	1.2662	***	1.2867	***	1.2693	***	1.2476	***
	(0.3443)		(0.3437)		(0.3448)		(0.3481)	
Size	-0.0590		-0.0591		-0.0557		-0.0547	
	(0.0663)		(0.0660)		(0.0662)		(0.0661)	
Age Business	0.0001		-0.0001		-0.0002		-0.0001	
	(0.0028)		(0.0029)		(0.0028)		(0.0028)	
Gender	0.2350		0.2472		0.2488		0.2234	
	(0.1960)		(0.1981)		(0.1966)		(0.2016)	
Constant	1.3606	*	1.1313		1.1093	*	1.4841	
	(0.8160)		(0.7061)		(0.6318)		(0.9387)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,725		1,725		1,725		1,725	
F Stat	3.74	***	3.78	***	3.83	***	3.49	***
Adjusted R²	0.0624		0.0609		0.0617		0.0626	
R²	0.0744		0.0728		0.0736		0.0756	

The literature on cash holdings considers that the tangibility of assets (*Assets Tangibility*) cash-flows, capital expenditures, leverage (*Total Leverage*), firm's size (*Size*), firm's age (*Age Business*), growth (*Var Sales*) and net operating working capital are determinants of cash holdings (Ozkan et al., 2004; Opler et al., 1999; Maheswari and Rao, 2017; Arora, 2019). Although we use some of these variables in the main estimations, we include all the listed variables in the following models to ensure that our results are not affected by missing determinants of cash holdings. For the capital expenditure (*CAPEX*), we calculate:

$$CAPEX = \frac{\Delta Fixed\ Assets + Depreciation}{Total\ Assets}$$

Where: *ΔFixed Assets* is the variation of firms' fixed assets for consecutive years

To calculate the net operating working capital (*NOWC*), we use the measure from Aktas et al. (2015):

$$NOWC = \frac{Inventories + Accounts\ receivable - Accounts\ payable}{Sales}$$

Finally, for the cash-flows of SMEs, we calculate:

$$CF\ Ratio = \frac{Net\ earnings + Depreciations}{Total\ Assets}$$

Then, we test the relationship between the three dimensions of financial literacy (*FL Interest*, *FL Inflation*, and *FL Risk*) on *Cash Ratio*, using as control variables *Assets Tangibility*, *Var Sales*, *Size*, *CF Ratio*, *CAPEX*, *NOWC*, *Age Business*, *Gender*, and *Degree*. Table 2.13 reports the coefficients of the OLS estimations. We also use as an alternative dependent variable *I.A. Cash Ratio,* with the same control variables. Results are reported in Table 2.14. We observe that after adding control variables to the model, there is still no significant effect of financial literacy on the cash holdings of SMEs. Similarly, we observe in Table 2.14 that none of the three dimensions of financial literacy has an effect on *I.A. Cash Ratio*, which confirms that results in Table 2.6 are not affected by missing control variables.

Table 2. 13 The effect of financial literacy on cash holdings with alternative controls

Table 2.13 reports the coefficient for the OLS estimation of the effect of financial literacy on cash holdings of SMEs (*Cash Ratio*). The first model tests the effect of *FL Interest* on *the Cash Ratio*, the second model tests the effect of *FL Inflation* on *the Cash Ratio*, and the third model tests the effect of *FL Risk* on *the Cash Ratio*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's size (*Size*), the firm's amount of cash-flow scaled by total assets (*CF Ratio*), the firm's capital expenditures scaled by total assets (*CAPEX*), the firm's net operating capital (*NOWC*) and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns. In Table 13, we use 1,725 observations because of missing variables for *Cash Ratio*.

Firm-clustered standard errors in parentheses (382 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
			Cash Ratio					
Independent variables:								
FL Interest	-0.0867						-0.0814	
	(0.0640)						(0.0608)	
FL Inflation			-0.0336				-0.0293	
			(0.0452)				(0.0427)	
FL Risk					-0.0178		-0.0155	
					(0.0296)		(0.0296)	
Controls:								
Assets Tangibility	-0.2942	***	-0.3027	***	-0.3010	***	-0.2994	***
	(0.0512)		(0.0504)		(0.0508)		(0.0510)	
Var Sales	-0.0671		-0.0780		-0.1224		-0.0413	
	(1.2493)		(1.2531)		(1.2406)		(1.2549)	
Size	-0.0132		-0.0132		-0.0127		-0.0125	
	(0.0096)		(0.0096)		(0.0096)		(0.0096)	
CF Ratio	0.3218	***	0.3263	***	0.3223	***	0.3186	***
	(0.0663)		(0.0669)		(0.0666)		(0.0664)	
CAPEX	-0.3231	***	-0.3197	***	-0.3240	***	-0.3194	***
	(0.0898)		(0.0902)		(0.0915)		(0.0913)	
NOWC	-0.0124		-0.0119		-0.0130		-0.0130	
	(0.0210)		(0.0209)		(0.0213)		(0.0212)	
Age Business	0.0001		-0.0000		-0.0000		0.0000	
	(0.0007)		(0.0007)		(0.0007)		(0.0007)	
Gender	0.0321		0.0344		0.0359		0.0289	
	(0.0298)		(0.0297)		(0.0295)		(0.0302)	
Constant	0.4169	***	0.3700	***	0.3507	***	0.4503	***
	(0.1077)		(0.1009)		(0.0931)		(0.1178)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,725		1,725		1,725		1,725	
F Stat	8.33	***	8.27	***	8.26	***	7.86	***
Adjusted R²	0.1551		0.1531		0.1528		0.1556	
R²	0.1668		0.1648		0.1646		0.1683	

Table 2. 14 The effect of financial literacy on industry-adjusted cash holdings with alternative controls
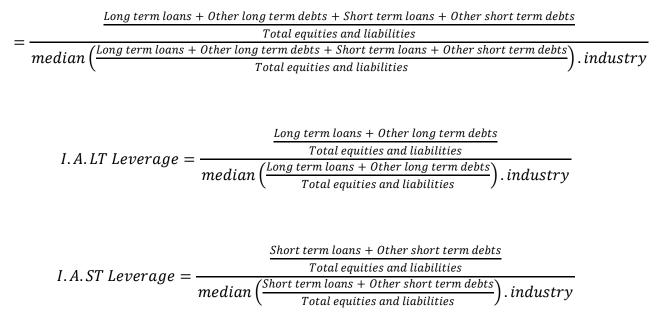
Table 2.14 reports the coefficient for the OLS estimation of the effect of financial literacy on industry-adjusted cash holdings of SMEs (*I.A. Cash Ratio*). The first model tests the effect of *FL Interest* on *I.A. Cash Ratio*, the second model tests the effect of *FL Inflation* on *Excess Cash*, and the third model tests the effect of *FL Risk* on *I.A. Cash Ratio*. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's size (*Size*), the firm's amount of cash-flow scaled by total assets (*CF Ratio*), the firm's capital expenditures scaled by total assets (*CAPEX*), the firm's net operating capital (*NOWC*) and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficients for *Degree*, years, and industry dummies for visibility concerns. In Table 2.14, we use 1,725 observations because of missing variables for *I.A. Cash Ratio*.

Firm-clustered standard errors in parentheses (382 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
				I.A. Cash Ratio				
Independent variables:								
FL Interest	-0.1890						-0.1592	
	(0.1578)						(0.1439)	
FL Inflation			-0.1236				-0.1104	
			(0.1486)				(0.1454)	
FL Risk					-0.1324		-0.1269	
					(0.1307)		(0.1298)	
Controls:								
Assets Tangibility	0.0859		0.0619		0.0605		0.0581	
	(0.2058)		(0.2005)		(0.2122)		(0.2098)	
Var Sales	23.5822		23.6163		23.4320		23.6519	
	(26.1369)		(26.1514)		(26.0739)		(26.1298)	
Size	0.5319	***	0.5324	***	0.5365	***	0.5374	***
	(0.1657)		(0.1659)		(0.1692)		(0.1695)	
CF Ratio	0.5669		0.5769		0.5468		0.5399	
	(0.4104)		(0.4104)		(0.4137)		(0.4146)	
CAPEX	-1.1810	**	-1.1673	**	-1.1828	**	-1.1671	**
	(0.5545)		(0.5570)		(0.5708)		(0.5723)	
NOWC	-0.0270		-0.0257		-0.0331		-0.0329	
	(0.0201)		(0.0196)		(0.0221)		(0.0216)	
Age Business	-0.0009		-0.0011		-0.0012		-0.0011	
	(0.0022)		(0.0023)		(0.0022)		(0.0023)	
Gender	0.0337		0.0346		0.0356		0.0177	
	(0.0719)		(0.0709)		(0.0712)		(0.0725)	
Constant	-3.4027	***	-3.4579	***	-3.4828	***	-3.2386	***
	(1.1307)		(1.1201)		(1.0900)		(1.0448)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	
N=	1,725		1,725		1,725		1,725	
F Stat	2.51	***	2.51	***	2.48	***	2.35	***
Adjusted R²	0.2472		0.2472		0.2482		0.2481	
R²	0.2577		0.2577		0.2587		0.2594	

Finally, we use an alternative measure for *Total Leverage*, *LT Leverage*, and *ST Leverage*, by adjusting them to the industry's median for each SME. Indeed, the main results of this study show that the financial literacy of entrepreneurs, especially their understanding of how compound interest works, has a positive influence on their long-term leverage. However, this result has little economic significance since we cannot identify if the concerned SMEs have particularly high or low leverage compared to their industries. The effect of financial literacy on long-term leverage might be observed only for SMEs with low leverage compared to their industry. Thus, we create three industry-adjusted measures of leverage (*I.A. Total Leverage*, *I.A. LT Leverage*, and *I.A. ST Leverage*) to address this issue:

$$I.A.\,Total\,Leverage$$
$$= \frac{\dfrac{Long\,term\,loans + Other\,long\,term\,debts + Short\,term\,loans + Other\,short\,term\,debts}{Total\,equities\,and\,liabilities}}{median\left(\dfrac{Long\,term\,loans + Other\,long\,term\,debts + Short\,term\,loans + Other\,short\,term\,debts}{Total\,equities\,and\,liabilities}\right).industry}$$

$$I.A.\,LT\,Leverage = \frac{\dfrac{Long\,term\,loans + Other\,long\,term\,debts}{Total\,equities\,and\,liabilities}}{median\left(\dfrac{Long\,term\,loans + Other\,long\,term\,debts}{Total\,equities\,and\,liabilities}\right).industry}$$

$$I.A.\,ST\,Leverage = \frac{\dfrac{Short\,term\,loans + Other\,short\,term\,debts}{Total\,equities\,and\,liabilities}}{median\left(\dfrac{Short\,term\,loans + Other\,short\,term\,debts}{Total\,equities\,and\,liabilities}\right).industry}$$

We use as control variables *Assets Tangibility*, *ROA*, *Size*, *Age Business*, *Gender*, and *Degree* as control variables. As for the main estimations in Table 2.3 and Table 2.4, we use OLS estimations with firm-clustered standard errors. In Table 15, we report the coefficients for the OLS estimations with *I.A. Total Leverage* as the dependent variable. In Table 16, we report the coefficients for the OLS estimations, with *I.A. LT Leverage* and *I.A. ST* Leverage as dependent variables.

Table 2. 15 The effect of financial literacy on industry-adjusted total leverage

Table 2.15 reports the coefficient for the OLS estimation of the effect of financial literacy on firms' total leverage divided by the industry's median total leverage (*I.A. Total Leverage*). The first model tests the effect of *FL Interest* on the industry-adjusted total leverage, the second model tests the effect of *FL Inflation* on the industry-adjusted total leverage and the third model tests the effect of *FL Risk* on industry-adjusted total leverage. In Model 4, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include years and industry dummies. We do not report the coefficient for *Degree*, years, and industry dummies for visibility concerns. Firm-clustered standard errors in parentheses (383 clusters); *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)	
Dependent variables				*I.A. Total Leverage*				
Independent variables:								
FL Interest	0.1334						0.1212	
	(0.1157)						(0.1126)	
FL Inflation			0.0395				0.0314	
			(0.0823)				(0.0791)	
FL Risk					0.0617		0.0584	
					(0.0664)		(0.0666)	
Controls:								
Assets Tangibility	0.3362	**	0.3468	**	0.3495	**	0.3456	**
	(0.1539)		(0.1544)		(0.1465)		(0.1478)	
Var Sales	-1.2043		-1.1720		-1.1135		-1.2125	
	(4.2623)		(4.2612)		(4.2412)		(4.2542)	
ROA	-1.2603	***	-1.2678	***	-1.2579	***	-1.2501	***
	(0.1622)		(0.1621)		(0.1622)		(0.1623)	
Size	-0.0068		-0.0069		-0.0088		-0.0091	
	(0.0345)		(0.0346)		(0.0347)		(0.0347)	
Age Business	-0.0037	**	-0.0036	**	-0.0036	**	-0.0036	**
	(0.0016)		(0.0016)		(0.0016)		(0.0016)	
Gender	-0.0501		-0.0544		-0.0537		-0.0445	
	(0.0550)		(0.0544)		(0.0541)		(0.0549)	
Constant	1.0118	***	1.0958	***	1.0905	***	0.9527	***
	(0.2809)		(0.2631)		(0.2541)		(0.2800)	
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
Degree	Yes		Yes		Yes		Yes	***
N=	1,761		1,761		1,761		1,761	
F Stat	4.41	***	4.40	***	4.56	***	4.17	***
Adjusted R²	0.1264		0.1253		0.1270		0.1274	
R²	0.1373		0.1363		0.1379		0.1393	

Table 2. 16 The effect of financial literacy on industry-adjusted long-term and short-term leverage

Table 2.16 reports the coefficient for the OLS estimation of the effect of financial literacy on the industry-adjusted long-term leverage (*I.A. LT Leverage*) and the industry-adjusted short-term leverage (*I.A. ST Leverage*). We adjust both firms' long-term and short-term leverages by dividing them by the median of the industry. The first model tests the effect of *FL Interest* on *I.A. LT Leverage*, the second model tests the effect of *FL Inflation* on *I.A. LT Leverage,* and the third model tests the effect of *FL Risk* on *I.A. LT Leverage*. In Model 4, the three dimensions of financial literacy are tested altogether. For Models 1 to 4, we use 1748 observations due to missing variables. The fifth model tests the effect of *FL Interest* on *I.A. ST Leverage*, the sixth model tests the effect of *FL Inflation* on *I.A. ST Leverage,* and the seventh model tests the effect of *I.A. FL Risk* on *ST Leverage*. In Model 8, the three dimensions of financial literacy are tested altogether. In each model, we control for the SMEs' asset's structure (*Assets Tangibility*), the firm's growth (*Var Sales*), the firm's profitability (*ROA*), the firm's size (*Size*), and the firm's age (*Age Business*). We also control for entrepreneurs' *Gender*, and educational background (*Degree*). We also include industry dummies. We do not report the coefficients for *Degree* and industry dummies for visibility concerns.
Standard errors in parentheses; *** $p<0.001$, **$p<0.05$, *$p<0.1$

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	I.A. LT Leverage								I.A. ST Leverage							
FL Interest	0.8143	**					0.6637	**	0.0933						0.0885	
	(0.3380)						(0.3111)		(0.1235)						(0.1233)	
FL Inflation			0.8112	**			0.7548	**			-0.0151				-0.0212	
			(0.3254)				(0.3179)				(0.1032)				(0.1012)	
FL Risk					0.5303		0.5025						0.0471		0.0454	
					(0.4740)		(0.4729)						(0.0634)		(0.0636)	
Assets Tangibility	3.6330	***	3.7536	***	3.6851	***	3.7246	***	0.0095		0.0131		0.0192		0.0125	
	(1.3238)		(1.3311)		(1.3084)		(1.3157)		(0.2035)		(0.2042)		(0.2014)		(0.2038)	
Var Sales	-35.7180		-36.1610		-35.0644		-36.1911		1.5839		1.6500		1.6485		1.6214	
	(58.8306)		(58.8944)		(58.4676)		(58.6585)		(2.7123)		(2.7158)		(2.7271)		(2.7242)	
ROA	-3.3453	***	-3.3763	***	-3.3070	***	-3.2523	***	-1.2231	***	-1.2294	***	-1.2208	***	-1.2160	***
	(1.0470)		(1.0513)		(1.0604)		(1.0615)		(0.1877)		(0.1873)		(0.1875)		(0.1878)	

Continued on next page

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Size	-0.3090	-0.3130	-0.3266	-0.3308	0.0040	0.0042	0.0025	0.0025
	(0.4852)	(0.4858)	(0.4946)	(0.4952)	(0.0251)	(0.0252)	(0.0250)	(0.0250)
Age Business	-0.0319 ***	-0.0312 ***	-0.0309 ***	-0.0307 ***	-0.0020	-0.0020	-0.0019	-0.0019
	(0.0080)	(0.0081)	(0.0080)	(0.0081)	(0.0018)	(0.0018)	(0.0018)	(0.0018)
Gender	-0.3801	-0.3572	-0.3921	-0.2949	-0.0320	-0.0385	-0.0343	-0.0311
	(0.2745)	(0.2721)	(0.2729)	(0.2785)	(0.0607)	(0.0589)	(0.0592)	(0.0599)
Constant	3.8051	3.7801	4.1753	2.8737	0.9790 ***	1.0782 ***	1.0312 ***	0.9719 ***
	(3.2757)	(3.2381)	(3.1436)	(3.0161)	(0.2464)	(0.2242)	(0.2148)	(0.2598)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Degree	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N=	1,748	1,748	1,748	1,748	1,761	1,761	1,761	1,761
F Stat	3.47 ***	3.19 ***	3.28 ***	3.19 ***	2.70 ***	2.70 ***	2.72 ***	2.51 ***
Adjusted R²	0.0603	0.0612	0.0615	0.0623	0.0905	0.0900	0.0909	0.0905
R²	0.0722	0.0731	0.0733	0.0752	0.1019	0.1013	0.1023	0.1029

Table 2.16 continued

We observe that after adjusting the total leverage of SMEs to the industry's median, there is still no significant relationship between financial literacy and total leverage. This confirms the results reported in Table 2.3. Moreover, we also observed in Table 2.16 that *FL Interest* has a positive and significant effect on *I.A. LT Leverage*. This result suggests that entrepreneurs with higher financial literacy have a higher leverage than their industry, which adds some economic meaning to the results in Table 4: the financial literacy of entrepreneurs increases the external financing of SMEs and helps entrepreneurs to have a more facilitated access to external finance than competitors in the same industry. This is particularly observed for entrepreneurs who have a higher understanding of how compound interests work and how inflation works. Finally, results in Table 2.16 show that there is no significant relationship between industry-adjusted short-term leverage (*I.A. ST Leverage*) and financial literacy, which is consistent with previous results.

Overall, the additional results confirm that the financial literacy of entrepreneurs has a positive effect on SMEs' leverage. This effect is particularly observable when focusing on financial leverage. The understanding of how compound interest works is the only dimension related to SMEs' leverage, similar to the main results. Furthermore, we show that financial literacy helps entrepreneurs to have higher leverage than their competitors. Finally, additional results confirm that the understanding of risk and risk diversification is the only dimension affecting cash holdings. Therefore, additional results support hypotheses H2a and partially support hypothesis H1.

7. Discussion

In this paper, we investigate how the financial literacy of entrepreneurs influences the capital structure of SMEs. We use three dimensions of financial literacy: the understanding of how compound interests work, the understanding of how inflation works, and the understanding of what risk and risk diversification are (Lusardi and Mitchell, 2008). Moreover, we investigate whether the financial literacy of entrepreneurs influences their cash management.

First, we observe that none of the dimensions of the financial literacy of entrepreneurs influences their total leverage. This result does not support hypothesis H1, which assumes that the understanding of compound interest would have a positive influence on entrepreneurs' total leverage. This result differs from existing pieces of literature since Basha et al (2023) observe that for both the long-term and short-term, financial literacy is negatively influencing SMEs'

leverage. From a broader perspective, this result also differs from the results found in the literature, which show that when entrepreneurs know more about finance and have more formal financial management of their firm, their access to external finance is increased (Hussain et al., 2018). This result therefore suggests that the relationship between entrepreneurs' financial literacy and SMEs' access to external finance is more complex. We suggest that financial literacy could have opposite effects on long-term and short-term leverages. While financial literacy might increase SMEs' access to long-term leverage, financial literacy could negatively influence the use of short-term leverage. Therefore, the abscence of results regarding the total leverage in this study might be due to the fact that the general leverage is a too general measure of SMEs' indebtedness, which implies to use alternatively short-term and long term-leverage as more reliable measure of SMEs' indebtedness.

The second result of this study is that the understanding of compound interests has a positive influence on SMEs' long-term leverage. This supports hypothesis H2a which assumes such a relationship. However, Basha et al. (2023) observe that financial literacy is negatively related to the long-term leverage of SMEs. Basha et al. (2023) suggest that because formal sources of finance are less available for SMEs, informal finance is an important component of SMEs' financing. Informal sources of financing include according to Basha et al. (2023) debt from non-financial institutions and borrowings from private lenders, relatives, and favorable credit terms. Basha et al. (2023) argue that the financial literacy of individuals reduce their use of informal sources of financing and thus predict that financial literacy would lower SMEs' leverage. In this study, we include only formal sources of financing. Thus, the difference between Basha et al. (2023) and this study's result might be due to the different definition of leverage we use.

Moreover, this result is consistent with previous studies which observe that entrepreneurs with higher financial awareness have better access to external finance (Hussain et al., 2018). This result is also consistent with the broader literature, which observes that the financial literacy of individuals is associated with higher use of formal source of financing (Klapper et al., 2013). The results in this study therefore highlight that the financial literacy of entreprneeurs is associated with the use of formal sources of credit for their SMEs. Moreover, the positive relationship between compound interests' understanding and long-term leverage is in line with the literature which shows that financial literacy is associated with more long-term planning and use of long-term financial products (Lahav et al., 2015). Thus, we identify

compound interest understanding as the sole dimension that increases entrepreneurs' use of long-term leverage.

Third, we observe that the understanding of compound interest is not related to the use of short-term leverage. This result does not support hypothesis H2b which assumes a negative relationship between short-term leverage and compound interests understanding. This result is not in line with the literature that explores the relationship between financial literacy and individuals' financial behaviors. Indeed, a large stream of literature (Goyal et Kumar, 2021) documents well that financial literacy reduces the use of credit card debts and short-term loans by individuals. The difference between individuals' and entrepreneurs' financial behaviors might be explained by the liquidity constraint that entrepreneurs face. Due to the cash-conversion cycle, entrepreneurs might need to rely on short-term loans and equivalent financial products to ensure the well-being of their activity. In that sense, using short-term financial instruments is not always detrimental for SMEs, especially when they use short-term financing tools dedicated to businesses such as account payables (or negotiating discounts with their bank) On the contrary, individuals and households' use of short-term credit is associated with detrimental effects on their financial inclusion and stability (Goyal and Kumar, 2021, for a systematic review). Therefore, the absence of a relationship between financial literacy and SMEs' short-term leverage might be explained by the fact that short-term leverage can be a useful financial instrument for SMEs.

Fourth, we observe that the understanding of risk and risk diversification is not related to both short-term and long-term leverage. This result does not support hypothesis H3 which assumes that risk understanding would increase entrepreneurs' bankruptcy awareness, leading them to avoid using debt. Basha et al. (2023) argue that one explanation of the negative relationship between financial literacy and SMEs' leverage is that financial literacy increases entrepreneurs' ability to evaluate the cost of potential distress. Therefore, entrepreneurs lower their use of debt to reduce the cost of potential distress. However, Basha et al. (2023) cannot identify in their study which chanel explains the variations of SMEs' leverage. We show in this study that financial literacy does not influence SMEs' leverage due to an increased awareness of bankruptcy costs.

Fifth, we show that the understanding of risk and risk diversification is not positively related to SMEs' cash holdings, as we assume in hypothesis H4a. We also observe that the understanding of how inflation works is not negatively related to SMEs' cash holdings, as

suggested by hypothesis H4b. This result is consistent with previous findings in this study, which tend to confirm that financial literacy does not increase entrepreneurs' precautionary behaviors. This contradicts previous pieces of literature that show that for individuals, financial literacy improves money management (Goyal and Kumar, 2021). We explain this result by the fact that SMEs' cash management might be due to environmental and firm factors rather than entrepreneurs' characteristics. Indeed, Opler et al. (1999) provide evidence that optimal cash holdings are found for each firm, based on firms' characteristics such as the firm's profitability, firm's growth opportunities, and firm's industry. Moreover, Gaio et al. (2022) and Orens and Reheul (2013) observe that the general education of entrepreneurs is not related to their cash holdings. Therefore, the results of this study confirm that entrepreneurs' educational background is not related to the cash holdings in their SMEs, even when considering the specific financial educational background.

8. Conclusion

In this paper, we test the effect of financial literacy of entrepreneurs on the leverage and cash holdings of SMEs. Financial literacy is the knowledge of individuals regarding baseline financial concepts (Lusardi and Mitchell, 2008): the understanding of how compound interests work, how inflation works, and what risk and risk diversification are. We hypothesize that the understanding of compound interest might increase SMEs' leverage, specifically for long-term leverage. We also suggest that risk understanding is associated with higher cash holdings in SMEs. We test the relationship between financial literacy and SMEs' capital structure using 1,761 firm-year observations of French SMEs. We use the AMADEUS database to gather the financial information of SMEs over the 2014-2023 period. Results show that the understanding of compound interest positively influences the level of long-term leverage of SMEs. However, we observe that the financial literacy of entrepreneurs does not influence the cash management of their SMEs.

This study contributes to the literature, as it shows that the different dimensions of financial literacy have various effects on SMEs' capital structure. Indeed, we show that only an understanding of how compound interests work has a positive and significant effect on SMEs' leverage. Although Lusardi and Mitchell (2008; 2014; 2023) and Mitchell and Lusardi (2015) provide theoretical explanations of how the different dimensions of financial literacy should impact individuals' financial behaviors differently, the entrepreneurial literature has not, to our

knowledge, embraced this issue. Indeed, the study of Basha et al. (2023) is the only which considers financial literacy as a potential determinant of SMEs' leverage and considers financial literacy as a monolithic construct. In this study, we provide evidence that each dimension of financial literacy has a specific effect on entrepreneurs' financial behaviors and thus shall be used as independent constructs.

This study also provides some empirical contributions to the literature. First, our study contributes to the nascent literature investigating the relationship between financial practices and knowledge and the capital structure of SMEs. Most studies in this stream of literature show that when entrepreneurs develop their financial practices such as establishing financial statements and reading specialized newspapers and financial reports, they increase their access to finance (Hussain et al., 2018). This relationship between financial practices and access to finance is found in both developed (Hussain et al., 2018) and developing countries (Addo and Asante, 2022). In this study, we focus on entrepreneurs' objective financial knowledge. While the literature on SMEs' capital structure frames financial practices as "financial knowledge" or "financial literacy", Lusardi and Mitchell (2014; 2023) show that the concept of financial literacy rather explains the financial behaviors of individuals. There is thus a need to disentangle the relationship between financial literacy and financial behaviors within the entrepreneurial context. This study is the first, to our knowledge, which uses the *Big Three* financial literacy dimensions as defined by Lusardi and Mitchell (2014) which are expected to provide the most stable empirical results (Mitchell and Lusardi, 2015).

Second, this study deepens the analysis operated by Basha et al. (2023). Although the authors investigate how financial literacy influences SMEs' leverage, they use country-level observations. Nevertheless, Lusardi and Mitchell (2014) have documented the importance of measuring financial literacy on an individual level, since financial literacy varies across the national population. For instance, Lusardi and Mitchell (2014) show that gender and lifecycle are important determinants of people's financial literacy. In this study, we propose a more fine-grained analysis of the relationship between financial literacy and firms' capital structure, as we rely on individual-level data.

Finally, this paper bears a practical contribution. We show that financial literacy increases the use of long-term leverage, which can prevent entrepreneurs from suffering from costly short-term loans. Moreover, by helping entrepreneurs to develop their long-term

planning and borrowing, financial literacy might be useful to promote SMEs' stability. In that sense, public authorities might be interested in developing entrepreneurs' financial literacy.

This study's main limitation is the lack of variation in financial literacy among the sampled entrepreneurs. Entrepreneurs in the sample used for this study have for a large majority of them a high level of financial literacy, which contradicts the literature in two ways. Wise (2013) highlights that entrepreneurs generally lack financial literacy and Arrondel (2017) highlights that the general French population struggles with financial literacy. Therefore, the results of this study might be influenced by the outstanding performance of entrepreneurs regarding financial literacy. Although we show that entrepreneurs' financial literacy is related to SMEs' capital structure, further studies are needed to extend our results to a more representative population of entrepreneurs. We suggest that using cross-country individual-level data would significantly contribute to the literature. Finally, this study calls for further investigations regarding the underlying mechanisms explaining the relationship between financial literacy and SME's capital structure. Indeed, we suggest that the understanding of how compound interests work positively influences the long-term leverage of SMEs because it fosters entrepreneurs' long-term planning. Moreover, we suggest that risk and risk diversification understanding increases SMEs' cash holdings by increasing entrepreneurs' precautionary behaviors. However, we cannot directly measure those mechanisms with the data available for this study. We suggest that further research might set up empirical designs that permit to capture those underlying mechanisms. One great opportunity would be to set up experimental designs, to test how the different dimensions of financial literacy influence entrepreneurs' long-term planning and precautionary behaviors.

Finally, while some papers (Maheswari and Rao, 2017; Ozkan and Ozkan, 2004) consider that cash holdings themselves represent a variable of interest, a large stream of literature focuses on determining how firms avoid holding an excess quantity of cash (Opler et al., 1999; D'Mello et al., 2008; Gao et al., 2013). A large stream of research documents well how financial literacy helps individuals to undertake financial decisions that favor their financial well-being, and fosters individuals' understanding of financial mechanisms. (Goyal and Kumar, 2021). Thus, financial literacy might not explain the cash holdings of SMEs but can be related to less excessive cash holdings.

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Chapter 3: We don't need no financial education? Does the faculty of study influence students' financial literacy? Evidence from French students[23]

Abstract

Although several initiatives exist to improve financial literacy, people's lack of financial literacy is still an unsolved problem. Financial literacy is an individual's level of knowledge of baseline financial concepts. Among the different populations facing issues with financial literacy, students have been of primary interest in recent research. However, the issue of specific fragile populations among the student community remains unaddressed. This study aims to fill this gap by exploring the relationship between the faculty of study and students' objective level of financial literacy, as well as students' perceptions of their level of financial literacy. We use a sample of 7,121 university students. The results show that economics and business students overperform in terms of objective financial literacy, relative to other faculties' students, whereas humanities students underperform. We also observe that social sciences and economics and business students are overconfident about their financial literacy.

Keywords – education; financial literacy; university; overconfidence

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[23] Ce chapitre a été co-écrit avec Anaïs Hamelin

Chapter 3: We don't need no financial education? Does the faculty of study influence students' financial literacy? Evidence from French students

1. Introduction

Despite public authorities displaying efforts to improve financial literacy, the lack of financial literacy remains an unsolved concerning issue (OECD, 2020). Financial literacy is the individuals' level of knowledge regarding baseline financial concepts. It is the combination of three core concepts (Lusardi and Mitchell, 2008): understanding of how compound interest rates work, understanding of the effects of inflation, and understanding of risk and risk diversification. Financial literacy influences individuals' financial decisions (Aubert et al., 2018; Broihanne and Orkut, 2018; Bucher-Koenen and Lusardi, 2011; Klapper and Panos, 2011; Van Rooij et al., 2011, 2012), such as individual investors' asset portfolio quality (Boolell-Gunesh et al., 2009, 2012; Orkut, 2021). Ultimately, financial literacy affects individuals' financial well-being (Lee et al., 2019) and financial inclusion (Grohmann et al., 2018). Therefore, several initiatives have been established to foster individuals' financial literacy and to increase people's financial well-being, such as the iconic Global Money Week. The OECD/INFE directs this initiative and has aimed to make people aware of the necessity of good planning regarding their wealth since 2012. Nevertheless, recent reports regarding financial literacy (OECD, 2016, 2020) show that global scores of financial literacy remain low. Currently, financial literacy programs target large segments of the world population (Global Money Week). Regarding the small effects of those general programs, one question remains of primary importance: Should financial literacy programs target everyone, or should they target specific segments of the population?

The literature has identified populations that have lower financial literacy and that should be targeted as a priority (see Goyal and Kumar, 2021, for a systematic review). Indeed, financial illiteracy is associated with higher credit card debt, worse loan management, and more generally ineffective financial planning (Lusardi and Tufano, 2015; Mitchell and Lusardi, 2015). For instance, females have been identified as a fragile population, with lower financial literacy than men (Fonseca et al., 2012; Lusardi and Mitchell 2008, 2011). Similarly, low-income households suffer from low scores in financial literacy (Hastings et al., 2013), whereas high-income households are more likely to have higher financial literacy (Atkinson and Messy, 2012). Regarding age, the literature identifies two fragile populations. On the one hand, the older part of the population lacks financial literacy, which might be an issue for financial retirement planning (Lusardi and Mitchell, 2011). On the other hand, results underline that

young people are less financially literate than the general population (Beal and Delpachitra, 2003; Lusardi and Mitchell, 2014; Lusardi et al., 2010). In this paper, we focus on the specific population of students, which is of primary interest as financial literacy is crucial for reducing students' financial fragility (Norvilitis et al., 2006; Xiao et al., 2011), thus increasing students' financial inclusion (Xiao and O'Neill, 2016) and financial well-being (Fan and Chatterjee, 2019). Therefore, identifying the determinants of students' financial literacy is of primary importance for both researchers and practitioners.

A stream of literature explores the determinants of students' financial literacy, with a significant focus on the role of individual determinants. First, demographic determinants are investigated. Chen and Volpe (1998, 2002) highlight that among students, a gender gap is observed regarding financial literacy, with females being less financially literate than males. Regarding age, older students have higher financial literacy scores (Brau et al., 2019). Second, social determinants are investigated. Brau et al. (2019) show that the education level of parents positively influences students' financial literacy. Finally, the literature investigates the effects of job experience on students' financial literacy. Chen and Volpe (1998) show that work experience during college studies positively influences students' financial literacy. Brau et al. (2019) highlight that students who experienced a job during high school have higher financial literacy. The role of education in students' financial literacy is the subject of some literature. Chen and Volpe (1998, 2002) highlight that more educated students (i.e., senior students) are more financially educated. Overall, the authors show that as students move up to a higher degree, they increase their financial literacy. The grounding studies of Chen and Volpe (1998, 2002) open up space for further studies. Sarigül (2014) highlights that with each step in a student's life (from *freshman* to *senior*), students increase their financial knowledge.

Nevertheless, an issue remains unaddressed in the literature: Do all faculties of study have the same effect on students' financial literacy? From a theoretical perspective, the faculty of study might affect students' financial literacy through several channels. On the one hand, the level of financial education that students receive is not homogenous across faculties of study, which might create heterogeneity of financial literacy across faculties of studies. Some studies find that pursuing a business or economics major is associated with higher objective financial literacy (Beal and Delpachitra, 2003; Chen and Volpe, 1998, 2002; Sarigül, 2014). On the other hand, numeracy is, according to Lusardi and Mitchell (2014), a major competence that supports the core concepts of financial literacy. Given the heterogeneity across faculties of study in terms

of numeracy (Jonas, 2018), we can expect a variation in financial literacy across faculties of study. Furthermore, the literature on financial literacy underlines that individuals' perceptions regarding their financial literacy score are a key factor to explain their financial decisions and relate strongly to their objective financial literacy (Allgood and Walstad, 2016). Thus, as objective financial literacy is likely to vary across faculties of study, we expect the same for subjective financial literacy. However, it could be the case that for some individuals, we observe a low level of objective financial literacy but a high level of subjective financial literacy. Chu et al. (2017) define overconfidence in financial literacy as the positive difference between subjective financial literacy and objective financial literacy. Overconfidence in financial literacy is linked with detrimental effects on financial decisions and inclusion for the general population (Pak and Chatterjee, 2016; Pikulina et al., 2017). Chu et al. (2017) and Pikulina et al. (2017) show that an increase in objective financial literacy is associated with lower overconfidence in financial literacy. Therefore, we expect to find a lower level of overconfidence in financial literacy in faculties with a higher level of objective financial literacy.

To investigate the heterogeneity across the faculties of study in students' objective and subjective financial literacy, we use data from an original survey designed for this study. The survey gathers information regarding students' financial literacy and faculty of study. We also gather information regarding students' sociodemographic characteristics. After checking for missing values, we use 7,121 observations in the estimations. The sample we use is large, compared to what is usually found in the literature, and we are able to confirm its representativeness. We analyze the data using different models. First, we use an ANOVA model to assess the effect of the faculty of study on students' financial literacy. Second, we use logit models, ordered logit models, and Bonferroni group comparisons to test if there are variations in students' objective and subjective financial literacy across faculties. Finally, we test the effect of the faculty of study on students' confidence in their financial literacy using multinomial logit models.

Overall, the results of this study show that there is a complex relationship between the faculty of study and students' financial literacy. First, we show that the faculty of study has a strong influence on the variance in students' financial literacy. Second, we observe that the relationship between the faculty of study and financial literacy differs across faculties. Third, we show that some students are miscalibrated in their confidence in financial literacy.

This study provides several contributions. First, we show that the faculty of study has the second largest influence on students' objective financial literacy and subjective financial literacy, which, to our knowledge, is a novel result in the literature. Second, we provide a more fine-grained analysis of the relationship between students' faculty of study and their objective financial literacy, in comparison with existing studies that only compare economics and business major students (Chen and Volpe, 1998, 2002; Sarigül, 2014). We provide evidence that there is an important heterogeneity of financial literacy across faculties of study. The biggest difference is found between the economics and business faculty and the humanities faculty. Third, we show that the faculty of study is also related to students' subjective financial literacy, which is unaddressed in the literature. Fourth, we highlight that there are variations in the miscalibration of students' subjective financial literacy across faculties of study. Fifth, the results are based on a unique and large dataset with 7,121 observations, which has no precedent in the literature on the educational determinants of students' financial literacy. Finally, this study has practical implications for authorities in charge of fostering the financial literacy of students. We identify two fragile populations in which they should put specific efforts: humanities students suffering from a low level of objective financial literacy and social sciences students suffering from overconfidence in their financial literacy.

In the next section, we explain the method we use. In section 3, we present the results. In section 4, we present some robustness checks. Section 5 discusses the results, and section 6 concludes.

2. Empirical strategy

2.1. Research design and sample

To explore the influence of the faculty of study on students' financial literacy, we collect unique data using an online questionnaire administered on LimeSurveyV3. We survey all 58,875 students from the University of Strasbourg. Besides gathering information regarding students' financial literacy and faculty of study, the survey also gathers detailed demographic and personal information. The survey lasts from the 21st of October 2021 to the 1st of December 2021. The raw dataset gathers 11,227 answers. After checking for missing values, the final dataset contains 7,121 complete observations.

2.2. Data description

In Appendix 1, we provide a table that summarizes the definition of the variables we use, how they are measured, and the source of each variable.

2.2.1. Dependent variables

Individuals' financial literacy is the dependent variable of the different models we specify. In the survey, students answer the Big Three financial literacy questions from the seminal work of Lusardi and Mitchell (2014). Arrondel (2017) uses a French version of the financial literacy questions, adapted in terms of wording and currency. Therefore, we use Arrondel's (2017) version of the financial literacy questions. The measure of financial literacy implies considering three factors that are determinants of individuals' financial literacy. The first factor that is measured is the ability to understand how compound interest works. We ask students how much there would be in a hypothetical savings account with an interest rate of 2% after letting on this account €100 for 5 years. Students have the choice between "Less than 102€," "More than 102€," "Exactly 102€," or "I don't know." The correct answer is "More than 102€." The second factor captured is the ability to understand the effects of inflation. We ask students what they could buy using a hypothetical savings account with €100 in it, with an interest rate of 2% and an inflation rate of 3%. The possible answers are "Less than today," "Exactly the same as today," "More than today," and "I don't know." The correct answer is "Less than today." The last factor defining baseline financial literacy is the understanding of risk and risk diversification. The measure is a true or false question, asking respondents if investing in a single stock company would provide a safer return than investing in a mutual fund. The correct answer is "False." For each question, we attribute a score of 0 for those who wrongly answer or who do not know and 1 for those who correctly answer the question. We thus have a dummy, *FL Interest*, *FL Inflation*, or *FL Risk*, for each question on financial literacy. Then, we add up all correct and incorrect answers for each student to obtain a general score of financial literacy, *Objective FL*, which ranges from 0 to 3.

We also capture the perceptions of students regarding their financial literacy. This self-assessed financial literacy is set in the different models as *Subjective FL*. To capture the students' subjective financial literacy, we use the construct proposed by Allgood and Walstad (2016). We ask the students, "Compared to your colleagues at the university, how do you assess

your level of financial literacy?" Students answer using a 7-point Likert scale, where 1 is the lowest score of subjective financial literacy and 7 is the highest score.

2.2.2.   Independent variables

The independent variable is the faculty in which the students are studying. Starting with the 36 faculties or institutes of the University of Strasbourg, we create 7 categories to regroup students. First, we regroup all the students studying in the fields of social sciences. This field includes, for instance, sociology students, law students, or political science students. This first group of students is the largest group, which is in line with the objective representation of the general population of the University of Strasbourg.[24]

Second, we create a group of students studying economics and business at the University of Strasbourg. According to the usual classification, those students are included with the social sciences students. However, we decide to classify them into a specific group due to their specific exposure to financial education and financial literacy. Indeed, having courses in economics and business exposes students to financial education, which might influence their financial literacy. Therefore, considering students in economics and business as a specific group is relevant to this study.

Then, we create a group of students in the natural sciences faculty. The students in that group mainly study chemistry or physics. They are close to the fourth group, which comprises students studying formal sciences. We distinguish between natural and formal sciences using the criterion of experimentation. We consider natural sciences all sciences that are based on experiments such as chemistry. On the other hand, formal sciences include disciplines such as mathematics or computer sciences.

The fifth group is composed of students taking courses in humanities. Students who have courses in literature, history, geography, arts, philosophy, psychology, and theology are part of that group.

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[24] To check for the representativity of the sample, we compare the students to the APOGEE database, which gathers the personal information of all students from the University of Strasbourg. The APOGEE database is updated each year using the mandatory registration forms that all students have to fill out.

We create a specific group for students that are pursuing health or life sciences studies. Indeed, in the French classification of sciences, health and life sciences are separated from other natural sciences. Finally, we regroup in other faculties all the students we cannot sort into any of the precedent groups. This category represents 0.9% of the sample. The distribution of the sample across faculties is similar to the distribution of students across faculties at the University of Strasbourg.

Regarding the analyses and the models we use in the following sections, we create a dummy for each faculty. For the following analyses, we set the reference group as the social sciences group. We decide to do so because this group of students is the most represented in the sample.

2.2.3. Control variables

The literature highlights that different factors influence students' financial literacy. Therefore, we control for those variables in the estimations. First, gender is a determinant of students' financial literacy. Females have a lower score in financial literacy than their male colleagues (Chen and Volpe 2002). For gender, we directly ask students to which gender they belong. Second, a higher degree level is associated with higher financial literacy among students (Chen and Volpe, 1998). We follow the distinction of Chen and Volpe (1998), adapting class rank to the French academic system. Third, the previous work experience of students has a positive influence on financial literacy among students (Brau et al., 2019). To control for this, we ask students whether they have already had a paid job. We also include a control variable capturing whether students have already done an internship. Fourth, parents' diplomas and income positively influence students' financial literacy (Brau et al., 2019). Thus, we control for the diploma level of both parents. Finally, we control for students' nationality and age. We add these control variables because they influence the general population's financial literacy (Lusardi and Mitchell, 2008, 2011).

3. Results

3.1. Descriptive statistics

Table 3.1 reports descriptive statistics. We observe that the median of correct answers in the sample is 2 out of the 3 questions of the financial literacy test, which is consistent with

previous findings (Lusardi and Mitchell, 2014). Also consistent with Lusardi and Mitchell (2014), most of the students in the sample correctly answer the question about interest rates. With 66.75% correct answers, the question of inflation rates is more difficult for students. Finally, the question of risk and risk diversification has the lowest rate of correct answers. We observe that the average subjective financial literacy of students in the sample is 3.0237. Compared to the study of Allgood and Walstad (2016), this is quite low. Indeed, in their sample from the general US population, Allgood and Walstad (2016) find an average subjective financial literacy of 4.9474.

Regarding the distribution of students across faculties in the sample, we observe that the largest group is represented by students studying in the social sciences faculty. The overall distribution across faculties in the sample is similar to the distribution observed for all students at the University of Strasbourg. Most of the sampled students are female. Although females effectively represent the majority of students at the University of Strasbourg, they are still overrepresented in terms of survey respondents. This is a common bias in surveys (Smith, 2008).

In Appendix 2, we provide a detailed description of the means of objective and subjective financial literacy for each faculty of study. We also break down the score of objective financial literacy into each question of financial literacy (the Big Three). We observe that humanities students are the lowest performing ones in terms of financial literacy. For each question, they have the lowest average score of correct answers. The understanding of how compound interest works is not an issue for most students. Surprisingly, the highest performing students are students in the natural sciences faculty. Economics and business students are the second highest performing students in terms of understanding how interest rates work. Regarding the understanding of inflation's effects, we observe a rise in incorrect answers for each faculty. Still, most students in each faculty correctly answer the inflation question. Finally, there is a gap between economics and business students and other students regarding the question of understanding risk and risk diversification. Of economics and business students, 78.43% correctly answer that question; the second highest performing faculty is formal sciences students, with 65.55% correct answers. Of the humanities students, 52.38% correctly answer that question, which is also the lowest rate in the whole sample for all financial literacy questions. For the French general population, the question of risk diversification is also the hardest one (Arrondel, 2017).

Table 3. 1 Descriptive statistics

Variables	N	Mean	SD	Variance	Median	Min	Max
Objective FL	7,121	2.1260	0.9103	0.8287	2	0	3
FL Interest	7,121	0.8358	0.3704	0.1372	1	0	1
FL Inflation	7,121	0.6675	0.4712	0.2220	1	0	1
FL Risk	7,121	0.6227	0.4848	0.2350	1	0	1
Subjective FL	7,121	3.0237	1.3986	1.9560	3	1	7
Faculty*:*							
Social Sciences	7,121	0.2868	0.4523	0.2046	0	0	1
Economics and Business	7,121	0.1094	0.3122	0.0974	0	0	1
Natural Sciences	7,121	0.0802	0.2716	0.0738	0	0	1
Formal Sciences	7,121	0.1048	0.3063	0.0938	0	0	1
Humanities	7,121	0.2211	0.4151	0.1723	0	0	1
Life Sciences	7,121	0.1887	0.3913	0.1531	0	0	1
Other Faculties	7,121	0.0090	0.0943	0.0089	0	0	1
Age	7,121	21.5662	4.0559	16.4504	21	16	75
Gender:							
Male	7,121	0.3390	0.4734	0.2241	0	0	1
Female	7,121	0.6478	0.4777	0.2282	1	0	1
Other	7,121	0.0132	0.1141	0.0130	0	0	1
Nationality:							
French	7,121	0.8708	0.3354	0.1125	1	0	1
Other countries from the EU	7,121	0.0397	0.1954	0.0382	0	0	1
Countries outside EU	7,121	0.0895	0.2854	0.0815	0	0	1
Current Degree:							
First year Bachelor	7,121	0.2446	0.4299	0.1848	0	0	1
Second year Bachelor	7,121	0.1833	0.3869	0.1497	0	0	1
Third year Bachelor	7,121	0.1855	0.3887	0.1511	0	0	1
First year Master	7,121	0.1711	0.3766	0.1418	0	0	1
Second year Master	7,121	0.1655	0.3717	0.1382	0	0	1
Ph.D.	7,121	0.0500	0.2179	0.0475	0	0	1
Parents Degree:							
Less than Baccalaureate	7,121	0.2136	0.4097	0.1550	0	0	1
Baccalaureate or equivalent	7,121	0.1770	0.3813	0.1455	0	0	1
Technical Degree	7,121	0.1969	0.3976	0.1582	0	0	1
Bachelor Degree or equivalent	7,121	0.1075	0.3089	0.0958	0	0	1
First year Master or equivalent	7,121	0.0814	0.2735	0.0748	0	0	1
Master Degree or equivalent	7,121	0.1655	0.3703	0.1376	0	0	1
Ph.D. or equivalent	7,121	0.0581	0.2309	0.0545	0	0	1
Already Paid Work	7,121	0.4631	0.4987	0.2487	0	0	1
Already Internship	7,121	0.4873	0.4999	0.2499	0	0	1
Selective Faculty	7,121	0.1852	0.3885	0.1509	0	0	1

Although the descriptive analysis suggests that the faculty of study has an effect on students' financial literacy, further analysis is needed to explore the relationship between the faculty of study and financial literacy.

3.2.   Does the faculty of study influence students' financial literacy?

To test whether the differences in students' financial literacy are related to their faculty of study, we first specify an ANOVA model. In the ANOVA model, the dependent variable is the measure of students' objective financial literacy and, alternatively, subjective financial literacy. As explanatory variables, we use the other determinants of financial literacy put forth in the literature (Brau et al., 2019): *Gender, Age, Nationality, Current Degree, Parents' Degree, Already Paid Work,* and *Already Internship.* Finally, we add to the model the variable *Faculty*, which is a categorical variable for each faculty of study of students. Table 3.2 displays the results.

Table 3. 2 ANOVA for objective and subjective financial literacy

In both ANOVA analyses, the first column reports the degrees of freedom for the model, the predictor variables, and the residual. Degrees of freedom (DF) represent the number of pieces of information available for each parameter. The second column reports the partial mean squares (Partial MS) which are the sum of squares for each parameter in the ANOVA, divided by the corresponding degrees of freedom. The third column reports the F-stat which is the ratio between the mean square of each parameter and the mean square error. In the left part of Table 3.2, we run the ANOVA analysis using *Objective FL* as the dependent variable. In the right part of Table 3.2, we use *Subjective FL* as the dependent variable. For each analysis, we also report the number of observations (N), the root mean square error (Root MSE) which is the square root of the mean square error, the r-squared (R^2) which is the proportion of the variance in the dependent variable that is explained by the model, and the adjusted r-squared (Adjusted R^2) which the r-squared corrected by the number of independent variables in the model.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

	Dependent variable: *Objective FL*				Dependent variable: *Subjective FL*			
	DF	Partial MS	F Stat.		DF	Partial MS	F Stat.	
Model	73	7.4325	9.78	***	73	24.9432	14.52	***
Faculty	6	26.5565	34.93	***	6	126.9943	73.92	***
Gender	2	94.3531	124.11	***	2	151.8135	88.37	***
Age	44	0.8108	1.07		44	3.7608	2.19	***
Nationality	2	0.0643	0.08		2	103.6146	60.31	***
Current Degree	5	4.8695	6.41	***	5	9.6101	5.59	***
Parent 1 Degree	6	2.5354	3.33	***	6	2.0493	1.19	
Parent 2 Degree	6	1.5442	2.03	*	6	3.7306	2.17	**
Already Paid Work	1	0.0022	0.00		1	24.3734	14.19	***
Already Internship	1	1.3498	1.78		1	12.3274	7.18	***
Residual	7,047	0.7602			7,047	1.7179		
Total	7,120	0.8287			7,120	1.9560		

N=7,121

Root MSE= 0.8719

R^2= 0.0920

Adjusted R^2= 0.0826

N=7,121

Root MSE= 1.3107

R^2= 0.1307

Adjusted R^2= 0.1217

The ANOVA shows that the variable *Faculty* significantly influences the variance of financial literacy variables (objective or subjective). In the first model, the variable *Faculty* is the second factor (behind gender) influencing the variance of objective financial literacy. Regarding students' subjective financial literacy, the variable *Faculty* is also the second strongest predictor of the variance of the dependent variable *Subjective FL*. Although the results show that the faculty of study has an influence on students' financial literacy, further analyses are needed to capture different effects across faculties.

3.3. Does the effect of faculty on financial literacy differ across faculties?

In this section, we break down the analysis of the relationship between the faculty of study and financial literacy by looking at the effect of each faculty of study on students' objective and financial literacy. We use students' answers to each Big Three (Lusardi and Mitchell, 2014) financial literacy question with logit models. Then, we investigate the relationship between the faculty of study and students' subjective financial literacy using an ordered logit model. Table 3.3 reports the coefficients for the logit and ordered logit models.

Table 3. 3 Effects of the faculty of study on students' financial literacy

In Model 1, we specify an ordered logit model to compare the understanding of the working of compound interest rates among the different faculties of the University. We chose a logit model as the dependent variable *FL Interest* is a dummy. We use dummies for each faculty of study as independent variables. To compare faculties, we exclude the dummy for Social Sciences Faculty from the model. All the coefficients represent the likelihood to have an understanding of the working of interest rates compared to Social Sciences students. We control for *Age*, *Gender*, *Nationality*, the current level of degree of the student (*Current Degree*), parents' degree (*Parent 1 Degree*, *Parent 2 Degree*), and if the student already had a paid job (*Already Paid Job*) or did an internship (*Already Internship*). In Model 2, we use as the dependent variable the understanding of the working of inflation, *FL Inflation*. In Model 3, we use the understanding of risk and risk diversification. In Model 4, we use the variable *Subjective FL* as the dependent variable. As *Subjective FL* is a score ranging from 1 to 7, we specify an ordered logit model. Ordered logit models do not have a constant coefficient as the probability of the dependent variable of taking in each category depends on cut points. Since there are 7 possible values of the variable *Subjective FL*, there are 7 cuts for the ordered logit model. For practical reasons, we do not report the cuts of the ordered logit model.

Standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$

	(1)		(2)		(3)		(4)	
VARIABLES	*FL Interest (logit)*		*FL Inflation (logit)*		*FL Risk (logit)*		*Subjective FL (ologit)*	
Independent variables								
Economics and Business	0.5220	***	0.6238	***	0.6844	***	0.7370	***
	(0.1365)		(0.1034)		(0.1031)		(0.0757)	
Natural Sciences	0.4941	***	0.0338		-0.3740	***	-0.5529	***
	(0.1631)		(0.1085)		(0.1004)		(0.0856)	
Formal Sciences	0.2214	*	0.1382		-0.1056		-0.2417	***
	(0.1308)		(0.1007)		(0.0953)		(0.0801)	
Humanities	-0.3873	***	-0.3993	***	-0.4373	***	-0.6317	***
	(0.0883)		(0.0727)		(0.0711)		(0.0618)	
Life Sciences	0.0262		-0.0623		0.0353		-0.7127	***
	(0.1004)		(0.0773)		(0.0755)		(0.0648)	

Other Faculties	0.2852		-0.3374		-0.5759	**	-0.5456	**
	(0.3715)		(0.2635)		(0.2582)		(0.2272)	
Controls								
Already Paid Work	-0.0221		-0.0263		-0.0025		0.1690	***
	(0.0699)		(0.0548)		(0.0530)		(0.0448)	
Already Internship	0.1550	*	-0.0421		0.0842		0.1254	**
	(0.0814)		(0.0636)		(0.0615)		(0.0524)	
Gender	Yes		Yes		Yes		Yes	
Age	Yes		Yes		Yes		Yes	
Nationality	Yes		Yes		Yes		Yes	
Current Degree	Yes		Yes		Yes		Yes	
Parent 1 Degree	Yes		Yes		Yes		Yes	
Parent 2 Degree	Yes		Yes		Yes		Yes	
Constant	1.0221	***	0.3167	*	1.0821	***		
	(0.2455)		(0.1901)		(0.1784)			
Observations	7,121		7,121		7,121		7,121	
Pseudo R²	0.0644		0.0446		0.0339		0.0374	
LR Chi²	409.23	***	403.5600	***	320.16	***	905.20	***
Log likelihood	-2974.9664		-4326.9006		-4559.3237		-11648.256	

Table 3.3 continued

Across all models, we observe that compared to social sciences students, students in the economics and business faculty are more likely to perform better on each financial literacy question. On the contrary, students in humanities are less likely to perform well on any question compared to social sciences students. This result is in line with previous findings, highlighting the role of faculties in shaping students' financial literacy (Chen and Volpe, 1998, 2002; Sarıgül, 2014). We observe that natural sciences and formal sciences students have a better chance at outperforming social sciences students on the question of interest rates. On the other hand, natural sciences students have lower chances of performing well than social sciences students when it comes to understanding risk and risk diversification. Therefore, the results suggest that faculties of studies foster different competencies of students that are useful for different dimensions of financial literacy. The results are consistent with the idea that numeracy, which is higher for science students due to their exposure to numbers and number manipulation, might increase their financial literacy, particularly the understanding of interest rates. According to Lusardi and Mitchell (2014), numeracy is a core competence explaining the performance on the interest rate question. On the other hand, numeracy is not involved in the understanding of risk and risk diversification, but other competencies might be important. The results suggest that the social sciences faculty might develop competencies that are beneficial for understanding risk, as social sciences students outperform on the risk diversification dimension of financial literacy. The economics and business faculty might foster competencies that are beneficial for each dimension of financial literacy because economics and business students outperform other students on each question.

The results on subjective financial literacy are consistent with the results on objective financial literacy. We observe that economics and business students are more likely to have higher subjective financial literacy than social sciences students. Humanities students have lower chances of having high subjective financial literacy than social sciences students. This is in line with Allgood and Walstad (2016), who show that objective and subjective financial literacy are highly correlated. However, social sciences students are more likely to have high subjective financial literacy than sciences (formal, natural, and life) students. This result is surprising because social sciences students do not differ from life sciences students in terms of objective financial literacy. This result suggests that there might be a phenomenon of miscalibration in terms of financial literacy across students. Therefore, further analysis is

needed to check whether the faculty of study has an influence on students' confidence in financial literacy.

3.4.   Differences in students' confidence in financial literacy

Confidence in financial literacy is the ability of individuals to correctly assess their level of financial literacy (Chu et al., 2017). To define students' confidence in financial literacy, we rely on the categorization of Allgood and Walstad (2016). A student with a score of objective financial literacy above the median of the sample (=2) has high objective financial literacy. We also use the median (=3) to distinguish between students with high or low subjective financial literacy. Thus, we can identify students with low objective financial literacy and high subjective financial literacy (Objective Low/Subjective High). According to Chu et al. (2017), these students are overconfident in their financial literacy. We also identify students with high objective financial literacy and low subjective financial literacy (Objective High/Subjective Low), who are underconfident in their financial literacy (Chu et al., 2017). Furthermore, we identify students with low objective financial literacy and low subjective financial literacy and students with high objective financial literacy and high subjective financial literacy. Students with a level of subjective financial literacy that matches their level of objective financial literacy have well-calibrated confidence. We create a dummy for each group of students, *Overconfident*, *Underconfident*, or *Well-Calibrated*. Table 3.4 summarizes the definition and construction of the variables. We use a multinomial logit model to compare students. Table 3.5 presents the results.

Table 3. 4 Definition of groups of confidence

Group	Definition	Confidence
Objective Low/Subjective Low	Objective FL <3 and Subjective FL <=3	*Well-calibrated*
Objective Low/Subjective High	Objective FL <3 and Subjective FL>3	*Overconfident*
Objective High/Subjective Low	Objective FL=3 and Subjective FL <=3	*Underconfident*
Objective High/Subjective High	Objective FL=3 and Subjective FL>3	*Well-calibrated*

Table 3. 5 Multinomial logit for students' confidence in financial literacy

To compare the confidence in financial literacy of students, we use a multinomial logit model. We use students that are *Well-Calibrated* in their confidence in financial literacy as the basis for comparison. Therefore, we use for each model the whole sample of students. Moreover, as we use a single multinomial logit model, only one log-likelihood, pseudo-R², and LR Chi² is reported. In Model 1, we compare the likelihood of students being overconfident in their financial literacy rather than being well-calibrated, according to their faculty of study. We control for *Age*, *Gender*, *Nationality*, the current level of degree of the student (*Current Degree*), parents' degree (*Parent 1 Degree*, *Parent 2 Degree*), and if the student already had a paid job (*Already Paid Job*) or did an internship (*Already Internship*).

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(1) Overconfident vs Well-Calibrated		(2) Underconfident vs Well-Calibrated	
Independent variables				
Economics and Business	-0.0404		0.0005	
	(0.1112)		(0.1079)	
Natural Sciences	-0.5292	***	0.1139	
	(0.1472)		(0.1152)	
Formal Sciences	-0.2558	**	0.0786	
	(0.1225)		(0.1101)	
Humanities	-0.3450	***	-0.0724	
	(0.0937)		(0.0879)	
Life Sciences	-0.5026	***	0.3109	***
	(0.1067)		(0.0855)	
Other Faculties	-0.3052		0.1699	
	(0.3647)		(0.3065)	
Controls				
Already Paid Work	0.2076	***	-0.0641	
	(0.0695)		(0.0619)	
Already Internship	0.0494		0.0211	
	(0.1300)		(0.0719)	
Gender	Yes		Yes	
Age	Yes		Yes	
Nationality	Yes		Yes	
Current Degree	Yes		Yes	
Parent 1 Degree	Yes		Yes	
Parent 2 Degree	Yes		Yes	
Constant	-1.0408	***	-0.7008	***
	(0.2207)		(0.2324)	
Observations	7,121			
Pseudo R²	0.0224			
LR Chi²	303.52	***		
Log likelihood	-6619.0899			

Overall, the results point to the existence of a relationship between students' faculty of study and students' financial literacy calibration. The results in Table 3.5 show that there is no significant difference between economics and business students and social sciences students in terms of their likelihood of being overconfident in their financial literacy. However, we observe that students in the natural, formal, and life sciences faculties and in the humanities faculty are less likely to be overconfident in their financial literacy than to be well-calibrated compared to social sciences students. On the contrary, we observe that life sciences students are the only students who are more likely to be underconfident in their financial literacy.

4. Robustness checks

In this section, we provide additional analyses to ensure the reliability of the results we presented in the previous section. First, some pieces of literature (Furrebøe et al., 2023; Klapper et al., 2013) use a score of objective financial literacy rather than correct answers to each question of financial literacy as a measure of objective financial literacy. Therefore, we specify a model using the score of objective financial literacy as the independent variable. We calculate the score of objective financial literacy by adding up all the correct answers to the Big Three questions of financial literacy. Thus, a student that has all correct answers has a maximal score of 3. Results are reported in specification 1 of Table 3.6. Using the score of objective financial literacy as the independent variable, we observe that economics and business students are more likely to outperform social sciences students in terms of objective financial literacy. This result confirms the findings in Table 3.4 because we observe that economics and business students are more likely to outperform social sciences students on each question on objective financial literacy. We also find, using the score of objective literacy, that humanities students are less likely to perform well in objective financial literacy than social sciences students. Again, this confirms the previous results in this study, which show that humanities students, on each question of financial literacy, perform worse than social sciences students. However, we do not find any significant difference between social sciences students and natural, formal, and life sciences students. We suggest that the absence of significant differences is due to compensating effects. On one hand, we observe in the previous results that formal and natural sciences students outperform social sciences students on financial literacy questions that involve numeracy. On the other hand, we show that social sciences students perform better on the risk and risk diversification question.

Second, some students in the sample are part of selective faculties. In the French academic system, students can pass highly selective exams before entering specific universities. Students who succeed in those exams can enter selective faculties, *Grandes Écoles*. Klapper and Léger-Jarniou (2006) show that students who are part of *Grandes Écoles* have specific sociodemographic characteristics that should be considered when researchers use samples with such students. Therefore, we create a dummy, *Selective Faculty*, to check whether the student is part of a French selective faculty. We add *Selective Faculty* as an additional control in the following models. The results are presented in specifications 2 and 3 in Table 3.6. For both objective and subjective financial literacy, adding *Selective Faculty* as a control variable does not affect the significance of the results. Moreover, we still find a positive effect of the economics and business faculty and a negative effect of the humanities faculty on students' financial literacy.

Table 3. 6 Effects of the faculty of study on students' financial literacy

In Model 1, we specify an ordered logit model to compare the scores of objective financial literacy among the different faculties of the University. We chose an ordered logit model as the dependent variable *Objective FL* is a score ranging from 0 to 3, with 0 being the lowest score and 3 the highest score. We use as independent variables the faculty of study of students. We control for *Age*, *Gender*, *Nationality*, the current level of degree of the student (*Current Degree*), parents' degree (*Parent 1 Degree*, *Parent 2 Degree*), and if the student already had a paid job (*Already Paid Job*) or did an internship (*Already Internship*). In Models 2 and 3, we add *Selective Faculty* as an additional control variable. In Model 3, we use the variable *Subjective FL* as the dependent variable. As *Subjective FL* is a score ranging from 1 to 7, we specify an ordered logit model.

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(1) Objective FL (ologit)		(2) Objective FL (ologit)		(3) Subjective FL (ologit)	
Independent variables						
Economics and Business	0.7258	***	0.6894	***	0.7298	***
	(0.0844)		(0.0869)		(0.0781)	
Natural Sciences	-0.1168		-0.1387		-0.5571	***
	(0.0902)		(0.0911)		(0.0864)	
Formal Sciences	0.0541		0.0775		-0.2370	***
	(0.0843)		(0.0854)		(0.0811)	
Humanities	-0.5212	***	-0.4960	***	-0.6267	***
	(0.0643)		(0.0659)		(0.0633)	
Life Sciences	-0.0088		0.0068		-0.7094	***
	(0.0671)		(0.0677)		(0.0654)	
Other Faculties	-0.3371		-0.3110		-0.5402	**
	(0.2342)		(0.2347)		(0.2276)	
Controls						
Already Paid Work	-0.0252		-0.0183		0.1704	***
	(0.0473)		(0.0474)		(0.0450)	
Already Internship	0.0732		0.0726		0.1255	**
	(0.0546)		(0.0546)		(0.0524)	
Selective Faculty			0.1178	*	0.0239	
			(0.0678)		(0.0636)	
Gender			Yes		Yes	
Age			Yes		Yes	
Nationality			Yes		Yes	
Current Degree			Yes		Yes	
Parent 1 Degree			Yes		Yes	
Parent 2 Degree			Yes		Yes	
Observations	7,121		7,121		7,121	
Pseudo R²	0.0378		0.0380		0.0374	
LR Chi²	649.60	***	652.63	***	905.34	***
Log likelihood	-8269.7509		-8268.2349		-11648.185	

In addition to the results we present in Table 3.6, we perform Bonferroni's post-hoc tests to verify the significance of the pairwise group comparison. We perform group comparisons for each faculty on both objective and subjective financial literacy. The tables presenting the results of Bonferroni's post-hoc tests can be found in Appendix 3 and 4. The results are confirmed by Bonferroni's post-hoc tests that verify the significance of the pairwise group comparisons regarding objective financial literacy by faculty (see Appendix 3). We observe that economics and business students are more likely to outperform the other students in terms of objective financial literacy. We observe a negative difference between humanities students and sciences students (formal, natural, and life). The Bonferroni pairwise group comparison confirms the result regarding students' subjective financial literacy (see Appendix 4). Indeed, we observe that life sciences students, compared to social sciences students, economics and business students, and humanities students are more underconfident in financial literacy. This is also the case for humanities students.

5. Discussion

This paper investigates the effect of the faculty of study on students' financial literacy. To explore this issue, we rely on a uniquely large sample of 7,121 university students. The students come from a large university, and the sample is representative of the university's population. We use information regarding students' objective and subjective financial literacy. This paper provides several results.

First, we show that the faculty of study significantly influences students' financial literacy. Among all the effects influencing students' financial literacy that we test, the faculty of study is the second largest. We highlight the fact that among the determinants of students' financial literacy, the faculty of study is of primary importance. In the literature investigating the sociodemographic (Brau et al., 2019; Lusardi and Mitchell, 2008) and educational determinants of financial literacy (Beal and Delpachitra, 2003; Chen and Volpe, 1998, 2002; Sarigül, 2014), there is no study, to our knowledge, investigating the relative importance of each determinant of financial literacy. This issue is of primary importance because some determinants, such as gender or the parents' educational background, are deeply rooted in individuals. On the contrary, the faculty of study is a reachable determinant of students' financial literacy. Moreover, we show that the faculty of study is the second-largest determinant

of students' financial literacy. There is thus a double interest in acting on that specific determinant to foster students' financial literacy.

Second, we break down the global faculty effect on financial literacy by looking at the effect of each faculty on financial literacy and by comparing the difference of effects across faculties. On the one hand, we observe that students in the economics and business faculty have higher financial literacy scores than any other students, which is consistent with the fact that higher exposure to financial education positively influences financial literacy (Chen and Volpe, 1998, 2002; Sarigül, 2014). We further observe that humanities students perform worse than any other students. This is, to some extent, consistent with the fact that lower exposure to numeracy undermines financial literacy. The literature investigating the effect of faculty on financial literacy mainly distinguishes between students with a major in economics and business and other students (Chen and Volpe, 1998, 2000). Our study deepens this analysis by using a more detailed measure considering 7 different faculties as explanatory variables. Therefore, we provide a more fine-grained analysis of the relationship between the faculty of study and students' financial literacy. The results in this study point to a heterogenous effect of college education, depending on the faculty of study, on financial education.

Third, we also explore the effect of the faculty on students' subjective financial literacy. We find that economics and business students and humanities students have a subjective financial literacy that matches their objective financial literacy, which is consistent with Allgood and Walstad (2016). The only exception is social sciences students, who show a high score of subjective financial literacy, whereas they do not show a high score of objective financial literacy compared to other students. Literature shows that along with individuals' objective score of financial literacy, the perceptions the individuals have about their score of financial literacy is also a strong predictor of their financial behaviors (Allgood and Walstad, 2016). Therefore, identifying students' determinants of subjective financial literacy is of primary importance. In this study, we show that the faculty of study also has an effect on students' subjective financial literacy. To our knowledge, this study is the first to establish a link between the faculty of study and subjective financial literacy.

Finally, we show that social sciences students and economics and business students are overconfident in their financial literacy, whereas life sciences students are underconfident in their financial literacy. We shed light on differences in terms of miscalibration in subjective

financial literacy. The results highlight that some students suffer from overconfidence or underconfidence in financial literacy. These situations happen when there is a gap between students' objective and subjective level financial literacy (Chu et al., 2019). The nascent literature comparing individuals' objective and subjective financial literacy, for now, highlights that most individuals are well-calibrated (Allgood and Walstad, 2016). In the sample we use, social sciences students and economics and business students are overconfident in financial literacy. Therefore, we suggest that students suffer from miscalibration in terms of financial literacy. In that sense, future research should assess why students are suffering from miscalibration in subjective financial literacy, the effects of this miscalibration, and how to correct it.

Our work is also an empirical contribution as we rely on a sample with high potential in terms of generalization of results. Indeed, the seminal studies of Chen and Volpe (1998, 2002) on the educational determinants of students' financial literacy use samples with between 700 and 1,000 observations. More recent studies (Beal and Delpachitra, 2003; Sarigül, 2014) use samples with 1,000 observations. With 7,121 observations, the sample we use is, to our knowledge, the largest student sample used in the literature. We also check for the representativeness of the sample, and we provide in this paper a representative sample of the student population.

From a practical perspective, our study advocates targeting specific segments of the student population when developing financial literacy programs. Indeed, we identify an initial fragile population: humanities students who have the lowest objective financial literacy. Thus, financial literacy initiatives targeting this population should achieve a main objective: improving the financial knowledge of humanities students to foster humanities students' objective financial literacy because financial literacy is a key factor for students' financial well-being (Fan and Chatterjee, 2019). The second fragile population we identify is social sciences students. Although they do not show low scores of objective financial literacy, social sciences students have a high score of subjective financial literacy compared to other students. Previous studies show that for general populations, a discordance between subjective and objective financial literacy is detrimental to making healthy financial decisions (Allgood and Walstad, 2016). The mismatch between social sciences students' objective and subjective financial literacy might thus push them to make poor financial decisions. Our study shows that teachers and financial literacy programs should pay particular attention to social sciences students and

to some extent to economics and business students. It is important to bring social sciences students "back to reality" by making them aware of the gap between what they think about their level of financial literacy and their objective level of financial literacy.

Our study does not come without limitations. The data is collected during a single period. Thus, we are not able to compare individuals' scores of financial literacy before and after entering the university across different steps of their academic careers. We cannot assess whether the effect of the faculty we observe is due to a selection process of students when entering a faculty or to an educational effect. To address the issue, we suggest that further studies should employ a longitudinal design. In that way, it would be possible to measure the scores of financial literacy of students for different class ranks. Future longitudinal studies could check the potential educational effect of the faculty on students' financial literacy.

Although the sample is built on high-quality data, we only survey French students. This might affect the results in the sense that the organization of educational programs differs across countries. Whereas the French academic system operates with a strong distinction between faculties, other countries propose a major/minor system. In that type of educational system, we would expect to find a higher porosity regarding financial education, as students can choose to pursue an economics and business major without completely stopping attending other courses. Although financially literate students are concentrated in France, the distribution of financially literate students might be wider in countries with a major/minor system. To address this issue, we recommend conducting studies similar to this one in countries using a major/minor system.

6. Conclusion

In this paper, we investigate the effects of faculty of study on students' financial literacy. We measure students' financial literacy using an original questionnaire. We also capture students' perceptions of their financial literacy. The results suggest that students taking economics and business courses have the highest level of objective financial literacy compared to the rest of the students. On the contrary, students taking courses in humanities perform poorly in terms of objective financial literacy. Concerning perceptions of financial literacy, we observe that students in the humanities have low perceptions of their financial literacy, which is in line with their low level of objective financial literacy. We observe that students in social sciences have high subjective financial literacy, whereas they do not show outstanding performances in

173

terms of objective financial literacy. The results also suggest that students in social sciences might suffer from overconfidence in their financial literacy.

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Appendices

Appendix 1 Definition of variables

Variables	Measure	Use in the model	Type of variable	Source
Objective FL	Added scores for the Big Three questions (*FL Interest* for interest rate, *FL Inflation* for inflation rate, and *FL Risk* for financial risk)	Dependent variable	Categorical	Lusardi and Mitchell (2014), adapted in French by Arrondel (2017)
Subjective FL	Self-assessment on a 7-point Likert's scale	Dependent variable	Categorical	Allgood and Walstad (2016)
Faculty	Dummy for each Faculty: Social Sciences Economics and Business Natural Sciences Formal Sciences Humanities Life Sciences Other Faculties	Independent variable	Dummies	Sarigül (2014), adapted to the French academic system
Gender	=0 if Male =1 if Female =2 if Other	Control variable	Categorical	Chen and Volpe (2002)
Nationality	=1 if French =2 if Other European nationalities =3 if Outside EU nationalities	Control variable	Categorical	Lusardi and Mitchell (2011)
Age	2021-Year of birth	Control variable	Continuous	Lusardi and Mitchell (2008)

Current Degree	=1 if First-year Bachelor =2 if Second-year Bachelor =3 if Third (last) year Bachelor =4 if First-year Master =5 if Second (last) year Master =6 if Ph.D.	Control variable	Categorical	Chen and Volpe (1998)
Parent 1 and Parent 2 degrees	=1 if Less than Baccalaureate =2 if Baccalaureate or equivalent =3 if Technical degree =4 if Bachelor degree or equivalent =5 if First-year master or equivalent =6 if Second-year master or equivalent =7 if Ph.D. or equivalent	Control variable	Categorical	Brau et al. (2019)
Already Paid Work	=0 if the student never had a paid job =1 if the student already had a paid job	Control variable	Dummy	Brau et al. (2019)
Already Internship	=0 if the student never did an internship =1 if the student already did an internship	Control variable	Dummy	Brau et al. (2019)

Appendix 1 continued

Appendix 2 Additional descriptive statistics

Standard deviations in parentheses

	N=	Mean of *Objective FL*	Mean of *Subjective FL*	Mean of *FL Interest*	Mean of *FL Inflation*	Mean of *FL Risk*
Faculty:						
Social Sciences	2,042	2.1396 (0.9000)	3.1611 (1.3738)	0.8418 (0.3650)	0.6690 (0.4707)	0.6288 (0.4832)
Economics and Business	779	2.4814 (0.7490)	3.8601 (1.3336)	0.8973 (0.3038)	0.7997 (0.4004)	0.7843 (0.4115)
Natural Sciences	571	2.2102 (0.8216)	2.8932 (1.3301)	0.9089 (0.2880)	0.7180 (0.4503)	0.5832 (0.4935)
Formal Sciences	746	2.2466 (0.7042)	3.1676 (1.3689)	0.8660 (0.3409)	(0.7252) (0.4467)	0.6555 (0.4755)
Humanities	1,575	1.8387 (0.9901)	2.7530 (1.3604)	0.7486 (0.4340)	0.5663 (0.4957)	0.5238 (0.4996)
Life Sciences	1,344	2.1429 (0.8861)	2.6362 (1.3180)	0.8444 (0.3625)	0.6577 (0.4746)	0.6406 (0.4800)
Other Faculties	64	1.9219 (0.9479)	2.7500 (1.3214)	0.8594 (0.3504)	0.5781 (0.4978)	0.4844 (0.5037)

Selective Faculty:

Yes	1,319	2.3268 (0.8022)	3.2570 (1.4211)	0.9060 (0.2920)	0.7544 (0.4306)	0.6664 (0.4717)
No	5,802	2.0803 (0.9271)	2.9707 (1.3881)	0.8199 (0.3843)	0.6477 (0.4777)	0.6127 (0.4872)
Whole sample	7,121	2.1260 (0.9103)	3.0237 (1.3986)	0.8358 (0.3704)	0.6675 (0.4712)	0.6227 (0.4848)

Appendix 2 continued

Appendix 3 Bonferroni group comparison: objective financial literacy by faculty

For ordered logit models, the Bonferroni pairwise comparison reports the coefficients for each comparison. Therefore, the first column of Appendix 3 is similar to the results of Model 2 of Table 3.6. Coefficients represent the likelihood to have a higher score of objective financial literacy. For instance, the first coefficient is interpreted as so: students in Economics and Business faculty have higher chances to have a higher score of objective financial literacy than Social Sciences students.

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

	Bonferroni Comparison: *Objective FL* by Faculty										
	Social Sciences		Economics and Business		Natural Sciences		Formal Sciences		Humanities		Life Sciences	Other Faculties
Social Sciences	-											
Economics and Business	0.6894 (0.0869)	***	-									
Natural Sciences	-0.1387 (0.0911)		-0.8282 (0.1086)	***	-							
Formal Sciences	0.0775 (0.0854)		-0.6119 (0.1088)	***	0.2162 (0.1103)		-					
Humanities	-0.4960 (0.0659)	***	-1.1855 (0.0954)	***	-0.3573 (0.0983)	***	-0.5735 (0.0867)	***	-			
Life Sciences	0.0068 (0.0677)		-0.6827 (0.0957)	***	0.1455 (0.0970)		-0.0707 (0.0888)		0.5028 (0.0714)	***	-	
Other faculties	-0.3110 (0.2347)		-1.0004 (0.2451)	***	-0.1723 (0.2454)		-0.3885 (0.2411)		0.1850 (0.2348)		-0.3178 (0.2357)	-

Appendix 4 Bonferroni group comparison: subjective financial literacy by faculty

For ordered logit models, the Bonferroni pairwise comparison reports the coefficients for each comparison. Therefore, the first column of Appendix 4 is similar to the results of Model 3 of Table 3.6. Coefficients represent the likelihood to have a higher score of subjective financial literacy. For instance, the first coefficient is interpreted as so: students in Economics and Business faculty have higher chances to have a higher score of subjective financial literacy than Social Sciences students.

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

	Social Sciences		Economics and Business		Natural Sciences		Formal Sciences		Humanities	Life Sciences	Other Faculties
Social Sciences	-										
Economics and Business	0.7298 (0.0781)	***	-								
Natural Sciences	-0.5571 (0.0864)	***	-1.2869 (0.0997)	***	-						
Formal Sciences	-0.2370 (0.0811)	*	-0.9668 (0.0999)	***	0.3201 (0.1041)	**	-				
Humanities	-0.6266 (0.0633)	***	-1.3564 (0.0873)	***	-0.0695 (0.0931)		-0.3896 (0.0827)	***	-		
Life Sciences	-0.7094 (0.0654)	***	-1.4392 (0.0883)	***	-0.1523 (0.0920)		-0.4725 (0.0850)	***	-0.0828 (0.0687)	-	
Other Faculties	-0.5402 (0.2276)		-1.2700 (0.2359)	***	-0.0169 (0.2371)		-0.3032 (0.2336)		0.0864 (0.2279)	0.1692 (0.2284)	-

Bonferroni Comparison: *Subjective FL* by Faculty

Conclusion générale

Les petites et moyennes entreprises (PME) représentent la majorité des entreprises, au sein de l'économie mondiale comme française. De plus, les PME sont à l'origine en France de près de la moitié de la valeur ajoutée nationale, ce qui souligne leur importance dans l'économie française. Depuis les années 2000, on constate une augmentation du nombre de créations d'entreprises, mais également une augmentation des faillites d'entreprises. Ainsi, le développement de la vocation entrepreneuriale chez les individus doit s'accompagner d'une formation leur permettant de réussir dans leurs projets entrepreneuriaux.

Dans cette optique, l'éducation financière apparaît comme un type d'éducation de premier choix, à développer chez les entrepreneurs. Pour quantifier cette éducation financière, une très large partie de la littérature utilise la notion de littératie financière. La littératie financière se définit comme la compréhension des individus relative à des concepts financiers basiques. On peut identifier trois concepts clef : la compréhension du fonctionnement des intérêts composés, la compréhension du fonctionnement du mécanisme de l'inflation et la compréhension des notions de risque et de diversification des risques.

La littérature reliant la littératie financière à l'entrepreneuriat reste naissante. Certaines études établissent une relation entre la littératie financière et le développement des compétences entrepreneuriales, tandis que d'autres montrent une relation négative entre la littératie financière des entrepreneurs et l'accès au financement. Dans cette thèse, nous étudions les effets de la littératie financière des individus sur deux étapes du processus entrepreneurial, situées de part et d'autre du moment de la création effective de l'entreprise. D'abords, nous étudions la relation entre la littératie financière des individus et leur intention entrepreneuriale.

Dans ce premier chapitre, nous supposons que la littératie financière des individus renforce à la fois leurs compétences entrepreneuriales réelles et perçues, ce qui les amène à avoir une intention entrepreneuriale plus importante. Nous supposons à l'inverse qu'une littératie financière plus élevée peut permettre aux individus d'identifier et de quantifier plus facilement les risques liés à l'entrepreneuriat, ce qui pourrait les amener à avoir une intention entrepreneuriale plus faible. Pour tester ces hypothèses, nous utilisons les réponses données à un questionnaire que nous avons réalisé. Ce questionnaire s'adresse à l'ensemble des étudiants de l'Université de Strasbourg, et a collecté 11 227 réponses entre octobre et décembre 2021.

Pour ce chapitre, nous utilisons 8 274 réponses individuelles, représentatives des étudiants de l'Université de Strasbourg. L'analyse de ces réponses nous permet d'observer que la littératie financière a un effet positif sur l'intention entrepreneuriale des étudiants.

Ensuite, nous étudions dans un second chapitre l'effet de la littératie financière sur la structure de capital des PME. Nous utilisons chaque dimension de la littératie financière en tant que concept indépendant. Nous supposons que chaque dimension de la littératie financière a un effet différent sur le niveau d'endettement des entreprises et sur leur gestion de trésorerie. Pour analyser la relation entre la littératie financière et la structure de capital des PME, nous avons collecté les informations financières des PME françaises grâce à la base AMADEUS du Bureau Van Dijk. Nous avons croisé ces informations financières avec les réponses des entrepreneurs à un questionnaire que nous leur avons envoyé. Nous analysons 1 761 réponses par entreprises et par années. L'analyse de ces réponses met en lumière qu'une seule dimension de la littératie financière, la compréhension du fonctionnement de l'intérêt composé, a un effet sur le niveau d'endettement à long terme des PME. En revanche, nous ne trouvons pas de relation entre la littératie financière des entrepreneurs et la gestion de trésorerie des PME.

Enfin, dans un dernier chapitre, nous étudions l'influence des facultés de l'université sur le niveau de littératie financière des étudiants. Nous supposons que chaque faculté d'étude développe chez les étudiants des compétences spécifiques, qui vont influencer chaque dimension de la littératie financière de manière différente. Ainsi, un étudiant de la faculté de chimie est supposé développer plus facilement des compétences mathématiques, ce qui aura un effet positif sur les dimensions de la littératie financière associée à la compétence mathématiques (comprendre les intérêts composés et l'inflation). Pour étudier le lien entre la faculté d'étude et la littératie financière, nous utilisons la base de données constituée pour le premier chapitre. Nous utilisons 7 121 réponses représentatives des étudiants de l'Université de Strasbourg. Nos résultats soulignent les effets variés des facultés d'études sur la littératie financière des étudiants. Tandis que les élèves inscrits dans les facultés de sciences de gestion ou de sciences économiques sont les plus performants en termes de littératie financière, les élèves en humanités sont les plus fragiles. Nous identifions également des élèves sur-confiants dans leur niveau de littératie financière : les élèves inscrits dans les facultés de sciences humaines et sociales. Enfin, les élèves qui étudient dans les facultés de sciences de la vie sont sous-confiants dans leur niveau de littératie financière.

Les chapitres de cette thèse contribuent à la littérature portant sur l'éducation entrepreneuriale en étudiant les effets de l'éducation et des connaissances financières des entrepreneurs sur le processus entrepreneurial. D'abord, nous contribuons à la littérature existante en soulignant le fait que chaque dimension de la littératie financière produit des effets spécifiques sur le processus entrepreneurial. Nous montrons dans cette thèse que la compréhension de la notion de risque et de diversification des risques développe l'intention entrepreneuriale des individus, tandis que la compréhension du fonctionnement des intérêts composés augmente l'utilisation de dettes à long terme au sein des PME. Ainsi, nous montrons que l'influence de la littératie financière sur le processus entrepreneurial se fait par plusieurs canaux.

De plus, nous montrons dans cette thèse que la littératie financière influence le processus entrepreneurial sur plusieurs étapes. La littératie financière influence les entrepreneurs avant même la création effective de leur entreprise mais aussi une fois leur entreprise établie, de manière positive. Dans cette thèse, nous montrons donc la double utilité de la littératie financière : celle-ci permet de créer des vocations entrepreneuriales, tout en influençant les décisions financières des entreprises ainsi créées. Bien que les décisions financières ne représentent pas l'ensemble des décisions prises au sein des PME, les résultats de cette thèse suggèrent que la littératie financière peut être un moyen d'aider les entrepreneurs à créer et pérenniser leurs PME.

Cette thèse contribue également de manière empirique à la littérature portant sur le lien entre les connaissances des entrepreneurs et le devenir de leur PME. La littérature qui étudie le lien entre l'éducation financière des entrepreneurs et la pérennité de leurs PME reste naissante, mais elle montre une relation positive entre éducation financière, accès au financement et performance des PME. Cependant, cette littérature naissante n'utilise pas de mesure stable de l'éducation et de la littératie financière. Dans cette thèse, nous proposons de recourir à une mesure robuste de la littératie financière, qui a été très largement utilisée dans une importante frange de la littérature qui étudie la littératie financière des individus en relation avec leurs décisions financières. De plus, cette thèse propose d'utiliser chaque dimension de la littératie financière comme des concepts indépendants, comme le suggère cette littérature. Cette distinction entre les différentes dimensions de la littératie financière reste peu développée dans la littérature entrepreneuriale. Les résultats de cette thèse montrent pourtant l'intérêt de considérer chaque dimension séparément.

D'un point de vue pratique, les travaux de cette thèse montrent qu'en fonction de leurs objectifs, les pouvoirs publics ont intérêt à développer des dimensions de la littératie financière différentes. Ainsi, si l'on souhaite développer le nombre de créations d'entreprises, il est important de développer la compréhension du risque et de la diversification des risques, car cette dimension est liée à l'intention entrepreneuriale. Si l'on souhaite encourager les entrepreneurs à recourir à des sources de financement externe, alors le développement de la compréhension du fonctionnement des intérêt composés est plus intéressant. De plus, cette thèse met en lumière les populations particulièrement fragiles en termes de littératie financière, au sein de la population étudiante. Au-delà de la sphère entrepreneuriale, la littératie financière est un déterminant majeur du bien-être financier des individus. Ainsi, des programmes comme la Semaine de l'Education Financière de la Banque de France ont un intérêt à cibler plus spécifiquement ces étudiants fragiles.

Les travaux réalisés dans le cadre de cette thèse sont emprunts de certaines limites. D'abord, les résultats obtenus dans les trois chapitres sont basés sur l'étude de populations françaises. Or, les décisions financières des individus français sont influencées par des dispositions étatiques, ce qui n'est pas le cas dans des pays comme les Etats-Unis. Par exemple, 82% des Français possèdent un Livret A[25], qui est un placement règlementé. De plus, le système des retraites françaises assure à la majorité des Français un revenu assuré une fois leur quotité de travail réalisée. Ainsi, la population française peut être moins habituée que d'autres populations à prendre des décisions d'investissement. Les PME françaises ont recours à des experts externes, dont l'expert-comptable. Celui-ci reste un acteur très mobilisé par les PME, qui attendent de lui des conseils sur la gestion financière, sur la gestion de la trésorerie et sur les décisions d'investissement[26]. Ainsi, l'entrepreneurs français est accompagné par des experts qui peuvent contrebalancer son manque de littératie financière potentiel. Il serait donc intéressant d'étudier le lien entre la littératie financière des entrepreneurs et les différentes étapes du processus entrepreneurial sur une population internationale pour s'extraire du contexte spécifique français.

De plus, il serait intéressant d'étudier des étapes supplémentaires du processus entrepreneurial, dans leur relation avec la littératie financière. En effet, bien que l'intention

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[25] https://www.banque-france.fr/system/files/2024-07/ER-2023_web.pdf

[26] https://rfcomptable.grouperf.com/article/0453/ms/20170822153511618.html

entrepreneuriale soit l'origine de la création d'entreprise, chaque intention ne se transforme pas nécessairement en création effective. De plus, il serait pertinent d'étudier le lien entre la littératie financière des individus et la performance de leurs entreprises. En effet, bien que les décisions financières, notamment la politique de structure de capital, des PME soit un facteur déterminant de leur performance, il serait utile d'étudier comment la littératie financière peut influencer directement la performance de l'entreprise, en termes de rentabilité ou de croissance.

Enfin, cette thèse considère la littératie financière comme la compréhension des concepts de base, telle que définie dans une large littérature. En revanche, certaines études différencient la littératie financière basique de la littératie financière élevée. Certaines études ont montré que les connaissances financières des entrepreneurs leurs sont bénéfiques lorsqu'elles sont apprises sous forme de règles simples[27]. La définition de la littératie financière telle qu'utilisée dans cette thèse serait selon ce courant de la littérature déjà trop complexe pour les entrepreneurs. Pourtant, nos résultats montrent que la compréhension de mécanismes financiers est utile pour différentes étapes du processus entrepreneurial. Ainsi, il peut être intéressant pour de futures études de déterminer quel est le niveau optimal de littératie financière pour les entrepreneurs.

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[27] « Rules of thumb » dans la littérature

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Guillaume THÉVENET

Financial literacy and the entrepreneurial process

The role of formal education

Résumé

La littératie financière, définie comme la compréhension de concepts financiers simples, est un sujet majeur dans la littérature portant sur les décisions financières des ménages. Pourtant, le concept reste peu étudié dans le cadre des décisions des entreprises, notamment des PME. Étant donné qu'elle permet aux individus d'avoir une compréhension plus approfondie de la finance, il semble possible d'envisager un lien entre la littératie financière des entrepreneurs et les différentes étapes du processus entrepreneurial. Dans cette thèse, nous nous intéressons à deux étapes du processus entrepreneurial, situées de part et d'autre de la création effective de l'entreprise. D'abord, nous étudions dans un premier chapitre comment la littératie financière peut influencer la volonté des individus de créer leur entreprise. Nous nous intéressons plus particulièrement, dans ce premier chapitre, à la relation entre la littératie financière des individus et leur intention entrepreneuriale, première étape du processus entrepreneurial. Ensuite, nous nous intéressons à l'effet de la littératie financière sur les décisions financières des entreprises. Ainsi, dans un deuxième chapitre, nous étudions la relation entre la littératie financière des entrepreneurs et la structure de capital des entreprises. Nous étudierons également dans ce deuxième chapitre le lien entre la littératie financière des entrepreneurs et la quantité de liquidités présente dans leurs entreprises. Enfin, dans un troisième chapitre, nous nous intéressons au rôle que peut jouer l'université dans le développement de la littératie financière des étudiants. Nous étudions dans ce troisième chapitre l'effet de la faculté d'étude sur le niveau de littératie financière des étudiants.

Résumé en anglais

The concept of financial literacy, defined as the understanding of fundamental financial concepts, represents a significant area of inquiry within the broader field of household financial decision-making. Nevertheless, the concept remains under-researched in the context of corporate decisions, particularly those of small and medium-sized enterprises (SMEs). Given that it enables individuals to gain a deeper understanding of finance, it seems reasonable to posit a link between entrepreneurs' financial literacy and the various stages of the entrepreneurial process. This thesis focuses on two stages of the entrepreneurial process, situated on either side of the actual creation of the firm. In the initial chapter, we investigate the potential impact of financial literacy on the propensity of individuals to pursue entrepreneurial endeavors. In this initial chapter, we examine the relationship between individuals' financial literacy and their entrepreneurial intention, which represents the inaugural stage in the entrepreneurial process. Subsequently, we investigate the impact of financial literacy on entrepreneurial financial decisions. Consequently, in a subsequent chapter, we analyze the relationship between entrepreneurs' financial literacy and firms' capital structure. Additionally, we assess the correlation between entrepreneurs' financial literacy and the liquidity levels observed in their firms. In the third chapter, we investigate the role that universities can play in the development of students' financial literacy. To this end, we examine the effect of faculty of study on students' level of financial literacy.