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Three essays on real estate companies listed on the stock market

Saadallah Zaiter

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THÈSE DE DOCTORAT

DE L'UNIVERSITÉ PSL

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**Trois Essais sur les Sociétés Foncières Cotées sur les
Marchés Financiers**

Soutenue par

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Résumé

Cette thèse porte sur le secteur des sociétés foncières cotées sur les marchés financiers dont la capitalisation boursière est équivalente à 4.3% du PIB mondial. Le premier chapitre analyse le phénomène du « biais domestique » qui continue à constituer une énigme pour les chercheurs. Les investisseurs ont tendance à investir davantage dans leur propre pays et moins à l'international que la théorie de l'investissement ne le prédit. Les résultats du premier chapitre apportent une explication à ce comportement d'investissement. En utilisant un échantillon de sociétés foncières cotées aux États-Unis, les résultats indiquent que les opportunités de croissance dont disposent les sociétés foncières constituent un des principaux motifs qui poussent les foncières à se concentrer géographiquement dans une ou plusieurs zones géographiques. Le deuxième chapitre s'intéresse aux implications de ces « biais de localisation » en Europe. Ces biais peuvent affecter les décisions de placement des investisseurs institutionnels et peuvent par conséquent générer des surinvestissements dans certaines zones géographiques, qui sont généralement considérées comme offrant le meilleur rendement ajusté au risque. Les résultats confirment que les stratégies d'investissement adoptées par certaines foncières cotées contribuent à accélérer les processus de métropolisation dans dix pays européens. Enfin, le troisième chapitre étudie l'effet des investissements directs étrangers sur les sociétés foncières cotées dans huit pays de l'Asie-Pacifique. Les résultats montrent que seule la Chine exerce un impact puissant sur les rendements des foncières dans la région.

Mots clés : Sociétés d'investissement immobilier cotées, Concentration géographique, Options de croissance, Financiarisation, Investissements directs étrangers, Risques macroéconomiques.

Abstract

This thesis focuses on the listed real estate sector whose market capitalization is equivalent to 4.3% of global GDP. The first chapter analyzes “the home bias puzzle” which continues to be a puzzle for researchers. Investors invest more in their own countries and less so internationally than investment theory would predict. The results of the first chapter provide an explanation for this investment behavior. Using a sample of US listed real estate companies, the results indicate that the company’s decision to concentrate its business in one or several geographic areas is mainly motivated by the level of growth opportunities available to this company. The second chapter looks at the implications of these “location biases” in Europe. These biases can affect the investment decisions of institutional investors and might therefore generate over-investments in certain geographical areas, which are generally believed to provide the highest risk-adjusted expected returns. The results of the second chapter confirm that the investment strategies adopted by some listed real estate companies contribute to the acceleration of the metropolization processes encountered in ten European countries. Finally, the third chapter examines the effect of foreign direct investments on listed real estate companies’ returns in eight Asia-Pacific countries. The results show that only China has a potent impact on these returns.

Keywords : Real estate investment trusts, Geographic concentration, Growth options, Financialization, Foreign direct investments, Macroeconomic risks.

À mes parents.

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Introduction générale

L'immobilier, la plus grande classe d'actifs au monde, décrit l'environnement bâti, qui joue un rôle vital dans tous les aspects de l'économie, de la société et de l'environnement. La société ne peut fonctionner sans les services de la propriété commerciale, qui est une source fondamentale d'emploi et de croissance économique. Par ailleurs, le secteur de l'immobilier joue un rôle majeur dans l'économie, étant donné que les actifs immobiliers servent de collatéraux pour les établissements financiers prêteurs. L'immobilier constitue également une partie essentielle du portefeuille de placements des investisseurs institutionnels et particuliers.

En raison d'un certain nombre de caractéristiques inhérentes propres à l'immobilier, l'inclusion de l'immobilier physique au sein d'un portefeuille soulève des défis pour l'investisseur. Parmi ces caractéristiques, nous citons l'hétérogénéité importante et l'illiquidité des biens immobiliers, les valeurs unitaires importantes et la nécessité d'une gestion opérationnelle continue. La constitution d'un portefeuille immobilier bien diversifié peut donc s'avérer complexe. Ces défis peuvent être évités en investissant dans des formes alternatives d'investissement immobilier indirect, parmi lesquelles les sociétés immobilières – les REITs¹ jouent un rôle crucial.

De nombreux pays ont créé des régimes fiscaux REIT, afin d'éviter la double imposition et de créer des conditions de concurrence équitables entre les différentes formes de propriété immobilière. Une distinction claire entre les REITs et les sociétés immobilières non-REIT doit être établie. Afin d'obtenir le statut de REIT, une société immobilière doit satisfaire à certaines exigences énoncées dans la lé-

1. Une REIT (Real Estate Investment Trust), appelée en France SIIC (Sociétés d'Investissement en Immobilier cotées en Bourse) est une entreprise cotée qui possède et gère des biens productifs de revenus dans divers secteurs immobiliers, comme des immeubles de bureaux, des bâtiments industriels, des entrepôts, des centres commerciaux... La société est cotée en bourse afin d'assurer des transactions équitables et ordonnées.

gislation nationale. Les sociétés immobilières non-REIT sont celles qui sont soit domiciliées dans des pays sans législation relative aux REITs, soit qui ont choisi d'opter pour un statut non-REIT pour d'autres raisons.

Cette thèse de doctorat est consacrée à l'immobilier coté aux États-Unis, en Europe et en Asie-Pacifique. Ces trois régions représentent à elles seules plus de 92% de la valeur totale du secteur immobilier coté sur les marchés mondiaux. De plus, les sociétés immobilières cotées dans ces trois régions sont hétéroclites en raison des caractéristiques idiosyncrasiques de ces marchés. Ce manuscrit se compose de trois essais distincts qui examinent des questions pertinentes relatives à ces marchés. L'objectif général de ce travail de recherche est de contribuer à la connaissance de l'immobilier coté, et d'apporter de nouveaux développements en la matière, dans le but d'aider les investisseurs et les décideurs politiques à mieux comprendre certains aspects de l'immobilier coté dans ces trois régions principales. Dans cette introduction, nous décrivons le contexte et l'importance du secteur de l'immobilier coté. Nous présenterons ensuite les trois chapitres qui constitueront cette thèse.

Le développement des REITs a permis d'atteindre deux objectifs financiers connexes : Premièrement, les REITs permettent aux investisseurs d'investir dans l'immobilier et de diversifier leurs portefeuilles en ajoutant une nouvelle catégorie d'actifs, et de se diversifier aisément au sein de cette catégorie. Deuxièmement, les REITs permettent aux directeurs et promoteurs immobiliers d'accéder plus facilement à de nouvelles sources de capitaux. D'un point de vue fiscal, les REITs permettent de poursuivre le premier objectif d'une manière fiscalement efficace. Les REITs ne sont pas concernées par l'impôt sur les sociétés, sans cela, elles seraient peu attrayantes pour les investisseurs, en comparaison avec d'autres moyens éventuels d'investissement immobilier. Ainsi, l'actionnaire est placé dans une position comparable à un investisseur qui détient un portefeuille immobilier en propre, puisque le flux locatif d'un tel investisseur ne sera imposé qu'à titre de revenu. En d'autres termes, ce régime de transparence fiscale crée des conditions de concurrence équitables entre le segment direct et le segment indirect du marché

immobilier.

Les REITs ont fait preuve de résistance face aux crises financières et représentent désormais la norme pour l'investissement immobilier indirect coté dans la plupart des pays. Il est à noter que les indices de rendements totaux annualisés des sociétés immobilières cotées ont surpassé les indices de référence des actions générales au cours de la plupart des 20 dernières années. Par exemple, l'indice FTSE EPRA Nareit Developed² a généré une performance annualisée de + 8,3% contre + 6,5% pour l'indice des actions FTSE Developed. Cependant, la question de savoir si les REITs se comportent plus comme des actions que comme de l'immobilier sous-jacent est ancienne et importante pour évaluer dans quelle mesure les REITs contribuent à la diversification d'un portefeuille d'actifs. En investissant dans une unité de REIT, les investisseurs acquièrent un investissement immobilier à moyen et long terme (MacKinnon and Al Zaman, 2009; Hoesli and Oikarinen, 2021); mais à court terme, les REITs peuvent être fortement corrélées au marché boursier (Hoesli and Oikarinen, 2012). Sur le moyen et long terme, l'immobilier coté devrait ainsi offrir les mêmes opportunités de diversification offertes par l'investissement dans l'immobilier direct.

Au niveau mondial, le marché des REIT a connu une croissance significative au cours des 20 dernières années, avec 20 pays adoptant une législation sur les REIT ou un équivalent. Aujourd'hui, 40 pays, dont l'ensemble des nations du G7 et près des deux tiers des pays de l'Organisation de coopération et de développement économiques (OCDE), ont mis en place un régime REIT.

Le marché américain des REIT est à la fois le plus important et le plus ancien au monde, et remonte à 1960 lorsque le Congrès américain a officiellement établi la structure des REIT. Ce n'est que depuis le début des années 1990 que le marché américain s'est développé tant en termes de volumes d'échanges que de capitalisation boursière grâce à la loi de 1986 portant sur la réforme de la fiscalité (1986 Tax Reform Act). Le développement du marché américain a représenté un facteur majeur de la croissance du secteur à l'échelle mondiale. Les REITs américaines

2. ftserussell.com/products/indices/epra-nareit

diffèrent de ceux de la plupart des autres juridictions par le fait qu'elles ne se limitent pas au marché immobilier privé, mais peuvent également investir dans des titres de créance immobiliers.

En Europe, les Pays-Bas ont été le premier pays à adopter un modèle de REIT en 1969. La Belgique a introduit son régime en 1995, la Grèce en 1999, la France en 2003, la Bulgarie en 2004 et la Lituanie en 2008. Par la suite, le Royaume-Uni, l'Allemagne et l'Italie ont adopté un statut similaire à partir de 2007, suivis par l'Espagne (2009), la Finlande (2010), la Hongrie (2011) et l'Irlande (2013). En 2019, le Portugal a également introduit le régime REIT. À ce jour, il n'existe pas de législation unifiée sur les REITs en Europe ; les lois sont adoptées au niveau national, et non par un conseil ou un organisme travaillant en Europe. En effet, la politique fiscale fait partie des compétences réservées des États membres de l'Union européenne. Cependant, une tentative d'harmonisation de la fiscalité est en cours. Dans sa communication sur la fiscalité des entreprises pour le XXI^e siècle, adoptée le 18 mai 2021, la Commission européenne a indiqué qu'elle proposera, d'ici 2023, un nouveau cadre pour l'imposition des revenus des entreprises en Europe (ou « BEFIT »).³ Dans son avis donné sur cette communication, l'association européenne de l'immobilier coté (European Public Real Estate Association - EPRA) a apporté une attention particulière à la nécessité d'établir un cadre réglementaire européen afin de faciliter la reconnaissance mutuelle des 14 régimes REIT existants par les États-membres.⁴

Bien que les régimes REIT puissent différer, la transparence fiscale et la limitation des activités immobilières constituent des caractéristiques communes. À l'exception de l'Australie, le marché des REITs en Asie-Pacifique est relativement jeune. Le marché australien des REITs a démarré beaucoup plus tôt que le marché asiatique des REITs. En 1971, la première REIT a été cotée à la Bourse australienne. Le Japon a été le pays pionnier dans le développement des marchés des REITs en Asie avec le lancement de deux REITs japonaises en septembre 2001. Peu après, la Corée du Sud et Singapour ont introduit leurs REITs en 2002. Hong Kong, la

3. L'initiative « BEFIT » fournira à l'UE un corpus réglementaire unique en matière d'impôt sur les sociétés, qui repose sur les éléments essentiels d'une base d'imposition commune et sur la répartition des bénéfices entre les États membres sur la base d'une formule de répartition.

4. ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12930-Un-cadre-moderne-pour-la-taxation-des-entreprises-de-l'UE_fr

Malaisie, Taïwan et la Thaïlande ont par la suite établi un régime REIT. En avril 2020, la Chine a annoncé un programme pilote pour la création de REITs axés sur le secteur des infrastructures. Neuf REITs ont été introduites sur les bourses de Shanghai et de Shenzhen en juin 2021.

L'Association européenne de l'immobilier coté a indiqué, dans son rapport trimestriel, que la valeur totale du secteur immobilier coté sur les marchés mondiaux couverts, à la fin du quatrième trimestre de 2020, s'élevait à près de 3,6 billions de dollars américains contre une capitalisation boursière totale de 102,5 billions de dollars américains (EPRA, 2021). L'immobilier coté en Asie-Pacifique représente environ 42% de ce chiffre, atteignant plus de 1,5 billion de dollars américains. La valeur totale du secteur immobilier coté aux États-Unis représente 34% de la valeur totale du secteur immobilier coté dans le monde ou 1,23 billion de dollars américains, alors que le secteur immobilier coté en Europe représente 16%, pour une valeur d'environ 583 milliards de dollars américains.

D'après le même rapport publié par l'EPRA, le marché américain des REIT incarne le plus vaste marché au monde, d'une valeur de 1,21 billion de dollars américains avec 192 REITs cotées et représente 63% de la capitalisation boursière mondiale des REIT. La valeur du marché des REIT en Asie-Pacifique s'élève à 402 milliards de dollars US avec 267 REITs cotées. Le Japon représente environ 35% du marché de la région avec une capitalisation boursière de 140 milliards de dollars américains et 66 REITs cotées. Le marché australien des REIT constitue le deuxième plus grand de la région, avec 41 REITs cotées d'une valeur de 107 milliards de dollars américains, soit 27% du marché total en Asie-Pacifique. Singapour, Hong Kong et la Malaisie représentent ensemble 28% de la capitalisation boursière de l'ensemble des REITs d'Asie-Pacifique. Le poids de la capitalisation boursière de l'ensemble des REITs d'Europe représente un peu plus que la moitié de celle de l'Asie-Pacifique, à environ 211 milliards de dollars américains et 201 REITs cotés. Les deux marchés les plus importants en Europe sont le Royaume-Uni (83 milliards de dollars américains et 57 REITs cotées) et la France (52 milliards de dollars américains et 27 REITs cotées).

Le développement des régimes des REIT a contribué à une croissance extraordinaire de la taille du secteur mondial de l'immobilier coté à partir du milieu des années 1990. Ce fut notamment au cours de la période suivant l'an 2000, marquée par la combinaison à la fois du lancement des véhicules REIT sur les principaux marchés asiatiques et européens, mais aussi de la solide performance des marchés américain et australien. Parallèlement, la décennie 2000 a été marquée par une accélération de la financiarisation de l'immobilier suite à la participation croissante des acteurs financiers dans la production urbaine et le rôle accru des techniques de la finance dans les dynamiques urbaines. Les REITs ont une forte tendance à concentrer leurs actifs dans certaines zones géographiques et/ou investir dans un type d'immobilier particulier (e.g., les bureaux, les centres commerciaux, les établissements de santé, l'industrie, etc.), dans la mesure où les investisseurs en immobilier coté, principalement les investisseurs institutionnels, préfèrent prendre leurs propres décisions de diversification. Geltner and Miller (2007) soutiennent que le marché de l'immobilier direct est relativement inefficace, les investisseurs devraient donc concentrer leurs investissements sur le(s) marché(s) sur lesquels ils bénéficient d'un avantage en matière d'information : leur marché d'origine ou domestique. Un contre-argument essentiel à cette notion de concentrer les investissements sur le marché intérieur réside dans les avantages de la diversification internationale.

Ce travail de recherche aborde ainsi des thématiques liées au processus de l'investissement des sociétés immobilières cotées. Nous mettrons en évidence le moteur essentiel qui guide la stratégie de concentration géographique adoptée par les sociétés foncières cotées. Ensuite, nous présenterons les implications spatiales de cette stratégie et nous mettrons en avant le rôle de l'immobilier coté en termes de canal de transmission des capitaux vers les territoires urbains. Ce flux des capitaux n'est cependant pas sans conséquences. C'est dans ce sens que nous allons explorer le rapport entre le phénomène de financiarisation et le processus de métropolisation. Enfin, nous aborderons l'importance de l'immobilier coté en tant que mécanisme de diffusion de l'effet des investissements directs étrangers chinois dans l'Asie-Pacifique.

Capozza and Seguin (1999) proposent les REITs comme un laboratoire d'essai idéal étant donné que nous pouvons créer des mesures de diversification précises en raison de la transparence des actifs sous-jacents des REITs. Les REITs qui limitent leurs avoirs à un seul type de propriété défendent généralement leur manque de diversification en affirmant que la direction possède une expertise particulière en matière d'investissement dans ce type spécifique de propriété. Il existe un certain nombre de raisons pour lesquelles les REITs choisissent de se concentrer géographiquement. Nous allons citer trois principaux arguments en faveur d'une stratégie de concentration géographique. Premièrement, les gérants de portefeuille doivent d'abord jouir d'une meilleure compréhension et connaissance des marchés et des secteurs spécialisés. La diversification réduit le nombre de marchés pour lesquels des informations et des analyses de marché s'imposent. Deuxièmement, la proximité offre un avantage en matière d'information aux investisseurs. Les coûts d'information réels et perçus (psychologiques) ont tendance à augmenter avec les distances physiques et psychologiques. Troisièmement, comme nous le soulignerons dans ce premier chapitre, la concentration géographique peut potentiellement offrir aux gestionnaires des opportunités précieuses. Comme souligné par Geltner et al. (2013), l'évaluation des REITs n'est pas uniquement liée à leurs actifs existants, mais également à leurs opportunités de croissance (ou *growth options*) représentées par leur capacité à réaliser des acquisitions, des développements et des cessions d'actifs. Tirtiroglu et al. (2017) mentionnent un certain nombre d'opportunités de croissance dans le secteur des REIT, telles que la possibilité d'attendre, d'abandonner ou d'étendre un projet ou de relocaliser des opérations ailleurs, de se privatiser, de s'engager dans des fusions et acquisitions ou des cessions d'actifs, ou de passer d'un sous-secteur à un autre.

L'objectif principal de ce premier chapitre est d'apporter un éclairage nouveau sur le « casse-tête du biais domestique (ou *home bias*) » en recourant aux options de croissance dans le contexte des REITs sur le marché américain. Les investisseurs ont tendance à investir davantage dans leur propre pays et moins à l'international que la théorie de l'investissement ne le prédit. Ce comportement d'investissement

anormal est qualifié de « casse-tête du biais domestique ». Des études financières consacrées à l'analyse du « biais domestique » ont rapporté que les investisseurs nationaux ont tendance à surperformer les investisseurs internationaux et que la surperformance est liée à la proximité géographique. Dans ce premier chapitre, nous fournissons une explication des meilleures performances réalisées par les investissements géographiquement concentrés, à partir d'un échantillon de 148 REITs américaines sur la période 1995-2017. Afin de démontrer que les REITs géographiquement concentrées disposent d'un plus grand nombre d'options de croissance au sein de leurs portefeuilles et sont mieux à même d'identifier et d'exploiter les opportunités de croissance que les REITs non concentrées, nous décomposons le bêta de chaque firme en son bêta d'actifs en place et son bêta d'opportunités de croissance. Nous avons ensuite divisé l'échantillon de REITs américaines en sociétés concentrées et non concentrées, sur la base de trois mesures de concentration géographique variant dans le temps en utilisant la base de données de SNL.⁵ Nous testons la robustesse de nos résultats en changeant le paramètre de la répartition des portefeuilles. Nous prenons également en considération le type d'actifs détenus par les REITs. Nous utilisons aussi le test de causalité de Granger par panel développé par Granger (1969) pour évaluer le lien de causalité entre les options de croissance et les mesures de concentration géographique.

Les résultats montrent que les options de croissance plutôt que les actifs en place représentent un facteur important dans la valorisation des REITs concentrées géographiquement. Un lien bidirectionnel entre les options de croissance et la concentration géographique a été établi. Globalement, nous montrons que les options de croissance, pour les REITs américaines, sont liées et constituent des variables importantes dans l'explication du processus de décision d'investissement. Les résultats de ce chapitre apportent une contribution méthodologique et théorique. L'apport méthodologique est l'utilisation d'options de croissance dans l'analyse du phénomène de la concentration géographique. Avec une approche théorique rigoureuse, nous apportons un éclairage nouveau « sur le casse-tête du biais domestique », toujours référencé comme l'un des casse-têtes majeurs de la macro-finance

5. <https://www.marketplace.spglobal.com/en/datasets/snl-real-estate-property-> (42)

(Obstfeld and Rogoff, 2000; Cooper et al., 2013). Nous expliquons ainsi la relation entre la surperformance et la proximité géographique.

Après avoir exposé, dans le premier chapitre, l'une des principales raisons (meilleure utilisation des options de croissance) qui poussent les REITs à se concentrer géographiquement dans une ou plusieurs zones géographiques, nous nous intéressons dans le deuxième chapitre aux implications de ces « biais de localisation » qui peuvent affecter les décisions de placement des investisseurs institutionnels. Ces « biais » peuvent générer des surinvestissements, par exemple, dans les centres financiers internationaux, qui sont généralement considérés comme offrant le meilleur rendement ajusté au risque (Lizieri and Pain, 2014; Henneberry and Mouzakis, 2014). Dans ce contexte, les stratégies d'investissement des sociétés foncières cotées sur les marchés financiers peuvent contribuer à remodeler la géographie de l'investissement immobilier commercial et à accélérer le processus de métropolisation, en supposant que les sociétés immobilières cotées ont tendance à adopter des stratégies d'allocation géographique alignées sur les préférences de localisation des investisseurs. Nous considérons l'Europe comme une étude de cas particulier dans ce chapitre compte tenu des changements majeurs subis par les marchés immobiliers en Europe. La mise en place de régimes REIT dans certains pays et l'anticipation de l'introduction des REITs dans d'autres ont transformé le secteur immobilier coté en produits d'investissement plus attractifs. En élargissant la base d'investisseurs, ces régimes ont permis d'investir davantage de fonds dans le marché urbain au cours des deux dernières décennies. Parallèlement, le concept de métropolisation a gagné en importance et a souvent été associé au concept de financiarisation. Cependant, la définition de la financiarisation de l'environnement urbain manque souvent de clarté et doit être déterminée (Lizieri and Pain, 2014; Halbert et al., 2014a; Aalbers, 2019).

Dans ce chapitre, nous explorons la relation entre la dynamique de financiarisation des sociétés foncières cotées sur les marchés financiers et leur participation à la dynamique de métropolisation, dans dix pays européens (Belgique, France, Allemagne, Suède, Suisse, Royaume-Uni, Finlande, Italie, Pays-Bas et Espagne).

La période d'étude, 2000-2017, est caractérisée par une mondialisation hétérogène des marchés immobiliers, des changements dans le milieu de l'entreprise et une évolution importante de l'économie urbaine traditionnelle. Nous analysons le phénomène de financiarisation en adoptant une approche à deux dimensions : le niveau spatial et celui de l'entreprise. La mesure de la financiarisation correspond à une augmentation du coefficient bêta, au sens du modèle d'évaluation des actifs financiers (MEDAF). Nous interprétons une augmentation du bêta comme un renforcement du degré de financiarisation de l'entreprise. Nous avons réparti notre échantillon d'entreprises dans ce chapitre en deux groupes : les entreprises « financiarisées » et les entreprises « non financiarisées ». La définition de la financiarisation est corroborée par un indice d'informativité que nous mesurons à travers plusieurs variables financières documentées par les publications financières comme ayant un effet important sur le niveau d'information. Nous utilisons également le système de la méthode généralisée des moments (System-Generalised Method of Moments - GMM) afin d'explorer une relation continue entre la financiarisation et la métropolisation. Pour documenter la manière dont les entreprises ont réalloué spatialement leurs portefeuilles, nous travaillons avec les zones urbaines morphologiques (MUA) et les zones urbaines fonctionnelles (FUA), telles que définies par le portail de la base de données ESPON.⁶

Les résultats de ce deuxième chapitre sont présentés au niveau spatial et celui de la firme. Nous décrivons dans ce chapitre la manière dont les entreprises redistribuent différemment leurs portefeuilles entre les espaces, en fonction de leur degré de financiarisation. Nous établissons également une causalité entre la financiarisation et la métropolisation et nous présentons un test de robustesse des résultats basé sur les caractéristiques financières des entreprises au lieu du bêta de l'entreprise comme mesure de financiarisation. Les résultats de ce chapitre indiquent que la financiarisation est généralement associée à une diminution du nombre d'actifs détenus, notamment aux Pays-Bas et au Royaume-Uni, alors que les entreprises

6. www.espon.eu.

ESPON est un programme de recherche, financé par la Commission européenne et les États membres, qui propose une meilleure connaissance des territoires européens aux acteurs de l'aménagement et du développement. Son rôle est de créer des outils permettant de développer des politiques et des stratégies efficaces en matière de développement territorial.

« non financiarisées » ont tendance à augmenter leur nombre d'actifs, notamment dans les pays tendant « à la fuite vers la qualité » comme l'Allemagne et la Suisse. Dans le premier cas, les espaces non urbains et les petites et moyennes agglomérations sont arbitrées au profit des noyaux urbains et des métropoles. Dans le second cas, les investissements sont réaffectés vers l'arrière-pays et les segments inférieurs de la hiérarchie urbaine. Au cours de la période d'étude, le parallélisme entre la hiérarchie financière et la hiérarchie urbaine s'est confirmé. L'Espagne illustre les risques de cette évolution, tandis que la Suède et la Belgique présentent des spécificités. La contribution de ce chapitre est double. Premièrement, nous introduisons une nouvelle mesure de financiarisation prenant en compte le bêta de l'entreprise et les caractéristiques financières des entreprises. Dans un deuxième temps, nous contribuons à la littérature en illustrant la manière dont les sociétés immobilières européennes cotées fonctionnent en tant que canaux de transmission entre les évolutions financières et urbaines à travers l'arbitrage des allocations spatiales de leurs investissements.

Dans le deuxième chapitre de cette thèse, nous décrivons comment le secteur immobilier coté en Europe joue un rôle de canal de transmission entre les marchés financiers et la nouvelle organisation spatiale et urbaine. Nous mettons en lumière, dans le dernier chapitre de la thèse, l'importance de l'immobilier coté en tant que mécanisme de diffusion de l'effet des investissements directs étrangers (IDE) chinois dans huit pays de l'Asie-Pacifique - APAC (Australie, Japon, Inde, Indonésie, Malaisie, Philippines, Singapour et Thaïlande).

Les informations macroéconomiques affectent le cours de l'action d'une foncière cotée, puisqu'elles affectent le sentiment global sur l'ensemble des marchés boursiers et étant donné le lien important entre les facteurs macroéconomiques et l'offre et la demande immobilière. Pavlov et al. (2015) ont documenté un rôle important des facteurs macroéconomiques dans l'explication des rendements boursiers des sociétés foncières cotées en utilisant un échantillon de 20 pays. L'impact des IDE sur les valorisations des actifs a aussi été analysé dans la littérature (Calvo et al., 1996; Kim and Yang, 2011b; Lieser and Groh, 2014). Les IDE chinois ont joué

un rôle clé dans l'émergence de la Chine parmi les économies APAC (Zhang and Sun, 2008; Davies, 2013). Les promoteurs et acheteurs immobiliers chinois font désormais partie intégrante de nombreux marchés immobiliers de la région APAC. Des études antérieures se sont concentrées sur l'explication des déterminants de l'IDE de la Chine (Buckley et al., 2007; Ramasamy et al., 2012; Blomkvist and Drogendijk, 2013). D'autres études ont examiné les conséquences des IDE chinois sur les pays de destination (Gholipour et al., 2014; Wong et al., 2014; Li et al., 2020; Gawellek et al., 2021). Face à l'essor rapide de l'économie chinoise et à l'internationalisation concomitante, les chercheurs en immobilier se questionnent sur la manière dont la « Chine globale » affecte les rendements des actifs immobiliers sur les marchés de l'APAC. Dans ce troisième chapitre, nous suivons l'approche utilisée par Pavlov et al. (2015) pour étudier l'impact de l'investissement immobilier à l'étranger de la Chine-Hong Kong (ci-après dénommé « CH-HK FDIRE ») sur les sociétés immobilières cotées dans huit pays de l'APAC. Nous utilisons des modèles de panel et contrôlons les variables macroéconomiques, le facteur boursier, le facteur immobilier résiduel, le risque de change, la gouvernance au niveau des pays et les caractéristiques individuelles des entreprises.

Les résultats de ce chapitre révèlent que le CH-HK FDIRE a un impact significatif sur les rendements des sociétés immobilières cotées dans les pays sélectionnés pendant la période 2007-2017. Fait intéressant, seule la Chine-Hong Kong exerce un impact aussi puissant sur les rendements des entreprises sélectionnées. Le FDIRE d'autres pays de l'APAC, comme le Japon, n'exerce pas d'impact significatif. Une analyse détaillée indique que l'impact identifié est différent selon les types de propriétés, les rendements des hôtels et des propriétés multifamiliales étant témoins de l'influence la plus puissante du CH-HK FDIRE. Cela semble indiquer qu'au cours de la période de 10 ans couverte par l'étude, un facteur continental existe pour les marchés immobiliers APAC. Cependant, il s'agit d'abord et avant tout d'un facteur chinois. Cet article contribue à faire la lumière sur les conséquences du FDIRE sortant de la Chine vers l'APAC afin d'aider les investisseurs à mieux appréhender le « risque chinois ».

Chapter 1

Why is there a Home Bias? An Analysis of US REITs Geographic Concentration[†]

Abstract

The aim of this paper is to shed new light on the home bias puzzle employing growth options. Using a unique property-level dataset, we show that geographically concentrated real estate investment trusts (REITs) are better able to exploit growth options than non-concentrated REITs. Our empirical results report that the beta of growth options is significantly greater than the beta of assets-in-place for REITs with higher geographic concentration. We also find evidence that growth options rather than assets-in-place seem to be an important component of geographically concentrated REITs' valuations. Overall, we suggest an explanation to the relationship between higher performance and lower geographical distance in the investment decision-making process.

Keywords: Real estate investment trusts; Geographic concentration; US; Information asymmetry; Beta; Growth options; Assets-in-Place.

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1.1 Introduction

Our main objective in this study is to shed new light on the puzzle of local asset concentration within the context of real estate investment trusts (REITs). We also analyze the economic effects of ownership distance on real estate returns. As highlighted by Hartzell et al. (2014), it is relatively straightforward to measure the diversification of REITs.

Home bias and asset diversification are well-known topics in financial literature. Since the initial work of Levy and Sarnat (1970),¹ the benefits of diversification, especially in the international context, have been well documented in the financial literature. As reported by Grubel (1968), the weak correlation of national or local financial markets, and the idea that a world market is a more complete market, justify two important motives for diversification: the search for higher returns at constant risk, and the reduction of risk at constant return. With the seminal work of French and Poterba (1991) and Cooper and Kaplanis (1994), financial literature has also reported a paradox: financial investors invest more in their own countries and less so internationally than investment theory would predict. This abnormal investment behavior is referred to as “the home bias puzzle”.

This behavioral bias related to investor proximity is also observed at a domestic or local level (within the same country). As reported by Coval and Moskowitz (1999, 2001), US mutual fund managers exhibit a strong preference for locally headquartered firms. Since the development of the prospective theory by Kahneman and Tversky (1974, 1979), the unknown is often perceived as riskier. As reported by Heath and Tversky (1991), between two identical games with the same probability of returns, economic agents consider the game they know less to be riskier. The lack of diversification (a high local or domestic concentration) and the reduction of physical and psychological distances with the target tend to reduce the levels of uncertainty and risk.

1. Completed by Solnik (1974), Adler and Dumas (1983), French and Poterba (1991), Cooper and Kaplanis (1994), Kang et al. (1997), Brennan and Cao (1997), Huberman (2001), Ahearne et al. (2004), and Van Nieuwerburgh and Veldkamp (2009).

Financial studies devoted to the analysis of home bias abroad or at home have also reported that national investors tend to outperform international investors and that investor proximity is related to higher performance, even if investment opportunities are neglected. As reported by French and Poterba (1991), Brennan and Cao (1997), Ahearne et al. (2004), Van Nieuwerburgh and Veldkamp (2009), Eichholtz et al. (2015), and very recently Ling et al. (2021a), information asymmetries among investors could explain these results. Proximity indeed provides an information advantage to investors. The real and perceived (psychological) information costs tend to increase with both physical and psychological distances.

While Zhang and Hansz (2019) find that greater REIT industry concentration implies that less risk leads to lower future returns and vice versa, there is very little scientific understanding of geographic concentration and real options in the REIT industry. In this article, we suggest an explanation for the higher performances observed with geographically concentrated investments. Higher returns related to home bias could be decomposed with real options, more specifically with growth options. Geltner et al. (2013) report that evaluation of REITs is not only related to their existing-in-place assets, but also to their growth opportunities as represented by their ability to make positive acquisitions, developments, and dispositions.

We use property-level data from SNL Real Estate's database to measure asset concentration and a firm's home bias. We compute the proportion of the properties held in the geographic area, MSA², in which the REIT is headquartered and the concentration of its assets across the entire MSA. Following Myers (1977) and Bernardo et al. (2007), we decompose the value of a firm into two components: the value of assets-in-place and the value of growth opportunities. More specifically, we are able to decompose a firm's beta into its beta of assets-in-place and its beta

2. The general concept of a metropolitan statistical area (MSA), as defined by the US Office of Management and Budget, is that of an area containing a large population nucleus (50,000 or more population) and adjacent communities with a high degree of integration with that nucleus. This classification provides a nationally consistent set of delineations for collecting, tabulating, and publishing federal statistics for geographic areas.

of growth opportunities. Our results report that the beta of growth opportunities is higher than the beta of assets-in-place for REITs with higher geographic concentration.³ As far as we know, this study is the first to use growth options to analyze the puzzle of geographic concentration. With this decomposition and a robust theoretical approach, we shed new light on the home bias puzzle, still referenced as one of the major puzzles in macro-finance (Obstfeld and Rogoff, 2000; Cooper et al., 2013). We suggest an explanation for the relationship between higher performance and lower geographical distance in the investment decision-making process. Our results are consistent with previous literature highlighting the role of information asymmetries (as initiated by French and Poterba (1991) and Gehrig (1993)). Using growth options, we are able to price investor proximity and to highlight the return related to ownership distance.

The main results indicate that concentrated REITs have higher unlevered market betas than non-concentrated REITs. However, the results obtained following betas' decomposition into the beta of growth options β^{GO} and the beta of assets-in-place β^{AIP} are striking. Firstly, regarding β^{AIP} , we do not observe an important difference across concentrated and non-concentrated REITs, whereas we observe large and statistically significant differences for β^{GO} ; for example, (i) 0.458 versus 0.368 during 1995-2017, (ii) 0.587 versus 0.438 during 2002-2017, (iii) 0.314 versus 0.161 during 2002-2007, and (iv) 0.788 versus 0.576 during 2009-2017. This implies that the unlevered betas' differences across concentrated and non-concentrated REITs derive essentially from growth option betas and not from assets-in-place betas. Secondly, the means of $(\beta_t^{GO} - \beta_t^{AIP})$ are positive and highly statistically significant for concentrated REITs across all different subperiods. Interestingly, the means of $(\beta_t^{GO} - \beta_t^{AIP})$ for non-concentrated REITs are not significant during all time periods. Growth options rather than assets-in-place seem to be an important component of concentrated REITs' valuations. As a robustness check, the results from the panel Granger causality test developed by Dumitrescu and Hurlin (2012) indicate that there is a bidirectional link between growth options and geographic concentration. Our results are confirmed when we account for real

3. Tirtiroglu et al. (2017) use this decomposition in a very different context: to analyze the dynamic of REITs from 1983 to 2012.

estate subsectors (Office, Retail, Residential, and Other) and are robust to the choice of split between geographically concentrated and non-concentrated REITs.

The article is organized as follows. Section 1.2 provides the theoretical and empirical framework adopted in the study, highlights the link between geographic concentration and growth options, and reviews some of the literature about diversification and geographic concentration. Section 1.3 discusses the sample data. Section 1.4 reports the results. Section 1.5 provides robustness checks. The conclusion summarizes the main results of the analysis.

1.2 Theoretical and Empirical Framework

1.2.1 Geographic Concentration and Growth Options

Tirtiroglu et al. (2017) mention a number of real options in the REIT industry, such as the option to wait, abandon, or expand a project or to relocate its operations elsewhere, go private, engage in mergers and acquisitions or asset divestitures, or move from one subsector to another, among others. In this paper we investigate the impact of geographic concentration on a firm's ability to extract growth options. We suggest that geographically concentrated REITs have a higher number of growth options in their portfolios. Moreover, we argue that geographically concentrated REITs are better able to identify and exploit growth opportunities than non-concentrated ones.

Growth options come from internal and external sources.⁴ Internal growth is growth via an improvement in profits at the property level, through increased rental revenues (rental revenue increments, improvements in tenant mix, tenant upgrades, property refurbishments, improvements in existing properties held by REITs, and increasing occupancy rates) and reduced operational expenses at one or more of the specific properties owned by the REIT (Koh et al., 2014). The greater the REIT's capability to assemble multiple properties in a single geographical area, the greater its capability to increase operating efficiency and bargaining power with tenants and thus generate better real estate returns (Block, 2011). In-

4. We thank an anonymous referee for the suggestions that follow.

ternal options also include operational (marketing, property management, leasing, and operating expenses) and managerial (higher institutional ownership) functions that allow the REIT to better identify opportunities. The commercial real estate market represents indeed a relatively inefficient, illiquid, and opaque market with greater scope for informational advantages that may lead to significant abnormal profits (Hochberg and Mühlhofer, 2017).

REITs can also generate external growth through the acquisition of attractive existing properties and property development (Chan et al., 2012). A parallel method of external growth closely related to new development is the expansion or redevelopment of existing successful properties. REITs that focus intensively on specific geographical regions have a significant edge in the competitive business of buying, managing, and developing real estate. REITs can also increase their profits externally through dynamic reallocation of their portfolios toward the best buildings by a selective picking of very well-located properties and taking advantage of the opportunities. External growth can also be achieved through participation in joint venture activities with institutional investors to acquire, own, and develop properties (Block, 2011). Hartzell et al. (2014) conclude that REITs with greater geographical diversification trade at a discount and that the presence of institutional investors substantially reduces this diversification discount. This point has been confirmed by Brounen and De Koning (2014) and more recently by Ling et al. (2021b).

Two possible explanations consistent with financial and real estate literature may support our assumption that geographically concentrated REITs have a higher number of growth options in their portfolios and are better able to identify and exploit growth opportunities than non-concentrated REITs.

As for the first argument, we argue that REITs, highly concentrated in a MSA, may have more bargaining power with tenants on the one hand (Block, 2011), and local authorities on the other (Halbert et al., 2014a; Guironnet et al., 2016). REIT managers have a common self-interest in discouraging competitors' entry

into a market for as long as possible. The time it takes for new competitors to enter the market would determine the period of advantage during which highly concentrated REITs may realize substantial economic advantage at the expense of their tenants (Dinsmore, 1998). Therefore, these REITs can develop greater expertise and reasonably seize greater opportunities to grow in the market. In addition, when the REITs' bargaining power with local authorities is stronger, their ability to minimize local authority interference and to exploit the real options induced by higher risk is greater. This kind of bargaining power can, to some extent, discourage potential entrants. Therefore, existing concentrated REITs with more market power are better able to identify and exploit future opportunities. The higher uncertainty inherent to future projects increases expected returns and leads to a higher growth options beta. Bernardo et al. (2007) argue that, *ceteris paribus*, firms with more growth opportunities have higher betas. A firm's growth opportunities include embedded options such as the options to delay, abandon, or expand a project. These decisions rely on information about future cash flows. An important literature has analyzed the link between market competition and growth options. Kulatilaka and Perotti (1998) conclude that firms with a strategic advantage (market power) are the most able to manage future growth opportunities when uncertainty is higher. Using real estate development data in Vancouver, Bulan et al. (2006) show that competition (increases in the number of potential competitors located near a project) and less concentration erode option values. More recently, Bustamante and Donangelo (2017) report that product market competition reduces the value of growth options and in turn reduces the loadings on systematic risk due to the threat of new entrants. Here, following the conclusions drawn by Kulatilaka and Perotti (1998), we argue that higher geographic concentrations of REITs (through market power) increase their ability to face competition. In this case, these REITs exhibit growth opportunities and could be compared to "growth assets", even if REITs tend to be generally considered as "value stocks". In this matter, concentrated REITs have the opportunities and the ability to invest in real estate projects that provide rates of return exceeding the cost of capital (definition of "growth assets"). As highlighted by Geltner et al. (2013), real estate is a "cash cow" but REITs can play in the "growth show" when

they exhibit growth opportunities ($NPV > 0$). These opportunities considered as real options, include developable land already owned, entrepreneurial abilities, and macro-level abilities (scale economies, franchise value, economies of scope...). Concentrated REITs are an illustration of this well-known statement made by Geltner et al. (2013): *“Most REITs are not growth stocks most of the time, but some REITs are growth stocks most of the time, and most REITs are growth stocks some of the time.”*⁵

The second argument may be seen as a complement to the first and is based on asymmetric information or psychological distance. It is well acknowledged in financial literature devoted to the home bias abroad (French and Poterba, 1991; Gehrig, 1993; Brennan and Cao, 1997; Van Nieuwerburgh and Veldkamp, 2009) or at home (Coval and Moskowitz, 1999; Huberman, 2001; Giroud, 2013) that local or domestic investors may benefit from information advantage for their investment decision-making. Proximity reduces asymmetric information and helps investors to use the information advantage to develop their business in their home (or local) markets. In this paper we argue that higher geographic concentration increases the quality and amount of information available to concentrated REITs. It also ensures improved monitoring of real estate properties. Moreover, geographic concentration allows REITs to achieve a more effective matching with potential renters. REITs develop better information and greater local expertise and reach operating efficiency through cost reductions. They are also more efficient in pricing properties and managing rents. It should be noted that REITs hold properties for relatively long periods of time. Therefore, a REIT’s total return comes from two sources: periodic cash flows (rents) and property price appreciation. In this regard, Mühlhofer (2013) claims that property prices contain information on forecastable short-term growth opportunities not yet present in rents.

Consequently, and in order to empirically test the relationship between geographic concentration and growth options, we proceed in two steps. Firstly, we define three complementary geographic concentration measures. Secondly, following the semi-

5. See Geltner et al. (2013), p. 604.

nal work of Myers (1977), we introduce the beta of assets-in-place, $\beta_{f,t}^{AIP}$, and the beta of growth options, $\beta_{f,t}^{GO}$. We estimate $\beta_{f,t}^{AIP}$, and $\beta_{f,t}^{GO}$, and split the sample of US REITs into concentrated and non-concentrated firms, based on different geographic concentration measures.

1.2.2 Geographic Concentration Measures

We expect to find a higher impact of the firm’s growth options on the firm’s asset beta for geographically concentrated firms. Therefore, we need to distinguish concentrated from non-concentrated firms. We compute three yearly time-varying geographic concentration measures, considering the MSAs as a collection of pre-defined zones.

Firstly, to determine the level of concentration of the firm’s properties at its headquarters MSA, we use a geographic concentration measure constructed by Ling et al. (2021b). We aim to explore if managers exploit their local information advantage by concentrating their asset portfolios in their home markets. The numerator in the following concentration measure corresponds to the properties owned by the firm at its headquarters MSA.

$$HOME_CONC_{f,T} = \frac{\sum_{i=1}^{N_{MSA-HQ,T}} (ADJCOST_{i,MSA-HQ,T})}{\sum_{m=1}^{N_T} \left(\sum_{i=1}^{N_{m,T}} (ADJCOST_{i,m,T}) \right)} \quad (1.1)$$

$ADJCOST_{i,m,T}$ is the “adjusted cost” of property i in MSA m during year T .⁶ $N_{m,T}$ represents the total number of properties held by firm f in a particular MSA during year T . N_T represents the total number of MSAs in which the firm invested in year T . $ADJCOST_{i,MSA-HQ,T}$ is the “adjusted cost” of property i at its headquarters MSA ($MSA - HQ$) during year T . $N_{MSA-HQ,T}$ represents the total number of properties held by firm f at its headquarters MSA during year T .

6. ADJCOST is defined by SNL Real Estate’s database as the maximum of the reported book value (item number: 221784), the initial cost of the property (item number: 221778), which is defined as the historic cost currently reported on the financial statements, and the historic cost of the property (item number: 221782), which is defined as the book value of the property before depreciation.

Secondly, one could also argue that managers can take advantage of information asymmetry if a great percentage of the REIT's total property portfolio is located in a specific MSA. Therefore, following Ling et al. (2021a), we introduce a single market concentration measure: *SINGLE_CONC*. It is defined as the largest percentage of a firm's total property portfolio located in any market, including the firm's headquarters location, within a particular year. The numerator is the total of all the properties owned by the firm in a specific MSA, as well as the denominator to all its properties across the MSA. We identify this specific MSA where the firm locates the largest percentage of its total property portfolio each year.

$$SINGLE_CONC_{f,T} = \frac{MAX\left(\sum_{i=1}^{N_m,T} (ADJCOST_{i,m,T})\right)}{\sum_{m=1}^{N_T} \left(\sum_{i=1}^{N_m,T} (ADJCOST_{i,m,T})\right)} \quad (1.2)$$

Thirdly, following Hartzell et al. (2014) and Demirci et al. (2018), we use the Herfindahl-Hirschman Index (HHI). The measure is defined as:

$$HHI_{f,T} = \sum_{m=1}^{N_T} \left[\frac{\sum_{i=1}^{N_m,T} (ADJCOST_{i,m,T})}{\sum_{m=1}^{N_T} \left(\sum_{i=1}^{N_m,T} (ADJCOST_{i,m,T})\right)} \right]^2 \quad (1.3)$$

The index ranges from $\frac{1}{N_T}$ to 1. Increases in the index indicate a higher concentration of the firm's properties (not necessarily the firm's headquarters MSA).

The first two measurements provide information on the concentration level in one singular MSA (the headquarters one, and the most-invested one), whereas the HHI is a global measure of concentration across all MSAs.

Firstly, we split firms into two groups of equal size (concentrated and non-concentrated) based on each of these geographic measures as of each year. We then use the methodology explained subsequently (in section 1.2.3) to estimate

β_t^{AIP} and β_t^{GO} for concentrated and non-concentrated firms.

1.2.3 A Decomposition of Market Beta

To decompose the unlevered beta of the firm f ($\beta_{f,t}^U$) into $\beta_{f,t}^{AIP}$, and $\beta_{f,t}^{GO}$, we follow Myers (1977), who shows that the value of the firm f ($V_{f,t}$) can be broken down into the present value of assets already in place ($V_{f,t}^{AIP}$) and the present value of future growth options ($V_{f,t}^{GO}$).

$$V_{f,t} = V_{f,t}^{AIP} + V_{f,t}^{GO} \quad (1.4)$$

The firm's beta at time t is thus the weighted average of its beta of assets-in-place and its beta of growth options:

$$\beta_{f,t}^U = \left[\beta_{f,t}^{AIP} \times \left[\frac{V_{f,t}^{AIP}}{V_{f,t}} \right] \right] + \left[\beta_{f,t}^{GO} \times \left[\frac{V_{f,t} - V_{f,t}^{AIP}}{V_{f,t}} \right] \right] \quad (1.5)$$

As highlighted by Bernardo et al. (2007), a firm's growth option *"is an option on its assets-in-place and, since this option has implicit leverage, the beta of its growth opportunity is greater than the beta of its assets-in-place."* They focus on 37 US industries of the Fama-French 48-industry classification. To disentangle the beta of assets-in-place and the beta of growth opportunities, the authors intend to reduce the estimation error (more specifically, error-in-variables). Therefore, they suggest aggregation and assume that these betas are the same for all firms in the same industry. Tirtiroglu et al. (2017) use the same assumption for REITs. Therefore, it follows from equation 1.5:

$$\beta_{f,t}^U = \beta_t^{GO} - [\beta_t^{GO} - \beta_t^{AIP}] \times \left[\frac{V_{f,t}^{AIP}}{V_{f,t}} \right] \quad (1.6)$$

To estimate β_t^{AIP} and β_t^{GO} , we follow the identification methodology used by Bernardo et al. (2007) and Tirtiroglu et al. (2017).

The dependent variable, $\beta_{f,t}^U$, is estimated, for each firm, in every month, using a five-year rolling (three-year minimum) Capital Asset Pricing Model (CAPM).⁷ We

7. We also conduct the analysis using a three-year rolling CAPM (one-year minimum). Re-

then compute the average equity beta of each firm every year using the monthly estimated equity betas. We filter the average beta of each firm for this particular year through the Hamada equation (Hamada, 1972) to get the corresponding unlevered beta for the same year. Since REITs benefit from corporate income tax exemption, the corporate tax rate in the Hamada equation is equal to zero, and the equation will be used as follows:

$$\beta_{f,t}^U = \frac{\beta_{f,t}}{\left[1 + \frac{D_{f,t}}{E_{f,t}}\right]} \quad (1.7)$$

Where $\frac{D_{f,t}}{E_{f,t}}$ is the ratio of the long-term debt to the market value of equity for the firm f at time t .⁸

We also need to get the independent variable $\left[\frac{V_{f,t}^{AIP}}{V_{f,t}}\right]$ of Equation 1.6. The ratio of the book value of assets to the market value of assets (B/M)⁹ can serve as a proxy¹⁰ (Bernardo et al., 2007; Tirtiroglu et al., 2017). As highlighted by Bernardo et al. (2007), *“the value of assets-in-place to the total value of the firm is proxied by the ratio of the book value of long-term outstanding debt plus book value of common equity to the book value of debt plus the market value of firm i at time t ...We also used other proxies for the value of assets-in-place...Since the book-to-market ratio, and other proxies we considered, are noisy measures of $\left[\frac{V_{f,t}^{AIP}}{V_{f,t}}\right]$, the errors-in-variables problem may bias downward the slope coefficients in our regression. To see if this is indeed the case, we performed two robustness checks...The results of these robustness checks are similar to those in the paper and are not*

sults are available upon request. We also report in the appendices (Table A1) the main results using a five-year rolling Fama-French Three-Factor Model: a market factor, a size factor, and a value factor.

8. Total Long-Term Debt (Compustat item: DLTT). Market Value of Equity= end-of-year price for firm f (PRCC) \times number of shares outstanding for firm f (CSHO).

9. Book Value of Assets= Book Value of Common Equity (CEQ) + Book Value of Long-Term Debt (DLTT). Market Value of Assets= Market Value of Equity (End-of-Year price (PRCC) \times Number of Shares Outstanding (CSHO)) + Book Value of Long-Term Debt (DLTT).

10. To avoid biases resulting from extreme values, we drop the observations to where the ratio of long-term debt to market value of equity or the ratio of the book value of assets to market value of assets are less than the 1st percentile or above the 99th percentile. We also drop monthly stock returns below the 1st percentile or above the 99th percentile.

reported for brevity”.¹¹

The final stage is to identify the intercept, β_t^{GO} , and the slope, $-\beta_t^{GO} + \beta_t^{AIP}$, using the following equation:

$$\hat{\beta}_{f,t}^U = \beta_t^{GO} - [\beta_t^{GO} - \beta_t^{AIP}] \times \left[\frac{V_{f,t}^{AIP}}{V_{f,t}} \right] + \epsilon_{f,t} \quad (1.8)$$

In the spirit of Myers (1977), we follow the approach developed by Bernardo et al. (2007) and used by Tirtiroglu et al. (2017). For each year T, we create two portfolios of firms based on their B/M ratios. We then compute, for each portfolio and for each year T, averages across the firms of the B/M and $\hat{\beta}_{f,t}^U$. This sorting will produce two observations based on the averages. Thus, we obtain a portfolio with a low B/M ratio (average of $\hat{\beta}_t^U$ and average of B/M ratio) and a portfolio with a high B/M ratio (average of $\hat{\beta}_t^U$ and average of B/M ratio).¹²

1.2.4 Diversification or Geographic Concentration

The diversification of building investments is an established topic in the real estate finance field. *The Journal of Real Estate Portfolio Management* can even be regarded as mainly being devoted to the issue. It is generally studied using the Markowitz paradigm. The segmentation on which diversification can be optimally realized is often discussed in literature: sectorial, economic or geographic (Viezer, 2000; Nelson and Nelson, 2003; de Wit, 2010; Glascock and Kelly, 2007; Stevenson, 2000). Real estate diversification offers benefits to investors in the residential (Wolverton et al., 1998), offices (Brown et al., 2000), or warehouse sector (Rabianski and Cheng, 1997).

Even though modern financial portfolio theory speaks for variety, some authors have also documented the existence of concentrated strategies (Leon and Craig, 1996). These concentration effects may be attributed to the benchmarking practices (Henneberry and Roberts, 2008), to the fuzziness of discounted cash-flow models that would generate conservatism bias toward core markets (Crosby and

11. Bernardo et al. (2007) p. 8, 11, and 13.

12. Bernardo et al. (2007) indicate that the “regression line” is then just a straight line that connects these two points and yields the intercept and slope coefficients.

Henneberry, 2016), or to the ability of the municipality to create and sell structured urban financial products (Weber, 2010). Liu et al. (2015) explain that the execution quality of a deal decreases with physical distance due to information asymmetry. Meanwhile, Graduate and Stanley (1995) document the difficulties of efficiently managing a distant building. Shilling et al. (2017) and Florida and Roulac (2007) point out a high correlation between real estate markets, and this implies that concentrated strategies are more relevant than costly diversified strategies.

Urban economics literature provides conflicting results that can vary temporally or according to the industry sector (Diodato et al., 2018). For instance, for retail stores, if Konishi (2005) documents the positive effects of concentration, Des Rosiers et al. (2009) document negative ones. This important literature reports that there is a need to explain the main motivations of geographic concentration, or home bias in real estate economics.

1.2.5 Robustness Checks

In order to test if our findings are robust to the choice of split between concentrated and non-concentrated portfolios, we sort firms into three terciles (High concentrated, Mid concentrated, and Low concentrated) based on each of the three geographic measures for each year. We also take into consideration REIT subsector representation by splitting our sample of REITs into four real estate subsectors (Office, Retail, Residential, and Other)¹³ and then sorting these subsamples into three terciles based on each of the three geographic measures.

We also use the panel Granger causality test developed by Dumitrescu and Hurlin (2012) to assess the causal link between growth options (proxied by Market-to-Book ratio¹⁴, a common proxy for growth options in finance and REIT literatures (Smith Jr and Watts, 1992; Cashman et al., 2019) and geographic concentration

13. “Retail” subsector includes Shopping Center properties, Other Retail properties and Regional Mall properties. “Residential” subsector includes Multifamily properties, Manufactured Home properties and Student Housing properties. “Other” category includes Industrial properties, Hotel properties, Healthcare properties and Specialty properties.

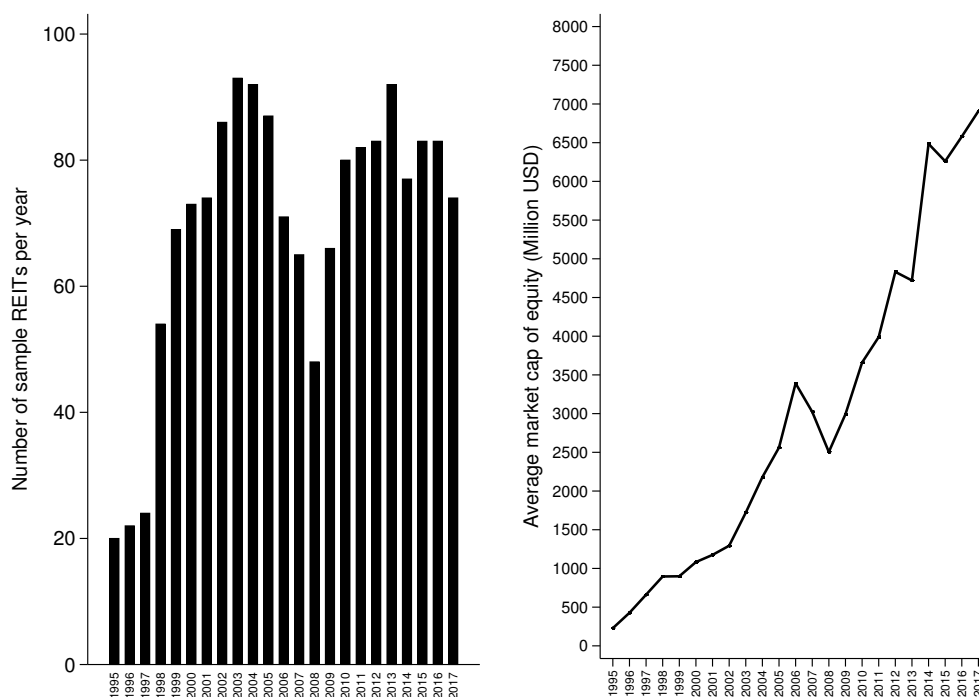
14. Market-to-book ratio is computed as the ratio of the market value of equity plus book value of long-term debt, to the book value of common equity plus book value of long-term debt.

measures. Dumitrescu and Hurlin (2012) state that their test is a simplified version of the Granger (1969) non-causality test for heterogeneous panel data models with fixed coefficients. Their test statistic is based on the individual Wald statistics of Granger non-causality averaged across the cross-section units.

1.3 Data Sources and Descriptive Statistics

Figure 1.1 reveals a sharp increase in the market value of US REITs. The size of an average US REIT rises from US\$250 million in 1995 to about US\$7 billion in 2017. Due to some missing data, namely entry and exit activity, the number of REITs changes every year. The average number of REITs per year is 76. Our sample consists of 148 distinct equity REITs with non-missing data obtained from SNL Real Estate’s database over the 1995-2017 sample period.

Figure 1.1 – Yearly Average Size and Number of Sampled REITs



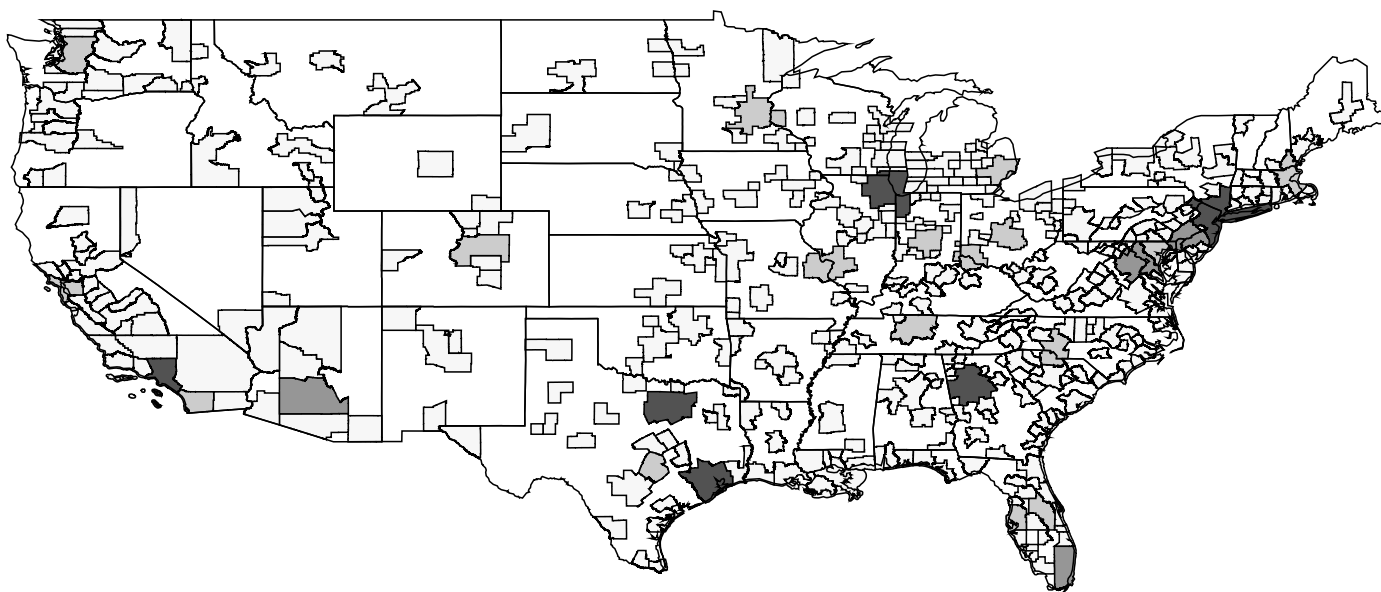
This figure plots the number and average size of our sample US equity REITs from 1995 to 2017.

We have collected data on all the properties (61,920 properties)¹⁵ purchased or sold by these 148 US equity REITs over the 1995 to 2017 period. The sample

15. The initial number of properties purchased or sold by these 148 US equity REITs is 71,352 properties. We have dropped properties with missing the “Adjusted Cost” variable.

includes 432,927 property-year observations. Figure 1.2 shows the geographical distribution of the properties by MSA. We observe a higher concentration of properties in New York (4%), Dallas (4%), Chicago (3%), Atlanta (3%), Houston (3%), Los Angeles (3%), Washington, DC (3%), and Philadelphia (3%). Overall, 26% of all the properties held by our sample REITs are located in these eight MSAs. Our sample of REITs are headquartered in 41 MSAs.¹⁶

Figure 1.2 – Geographic Distribution of Properties by MSA



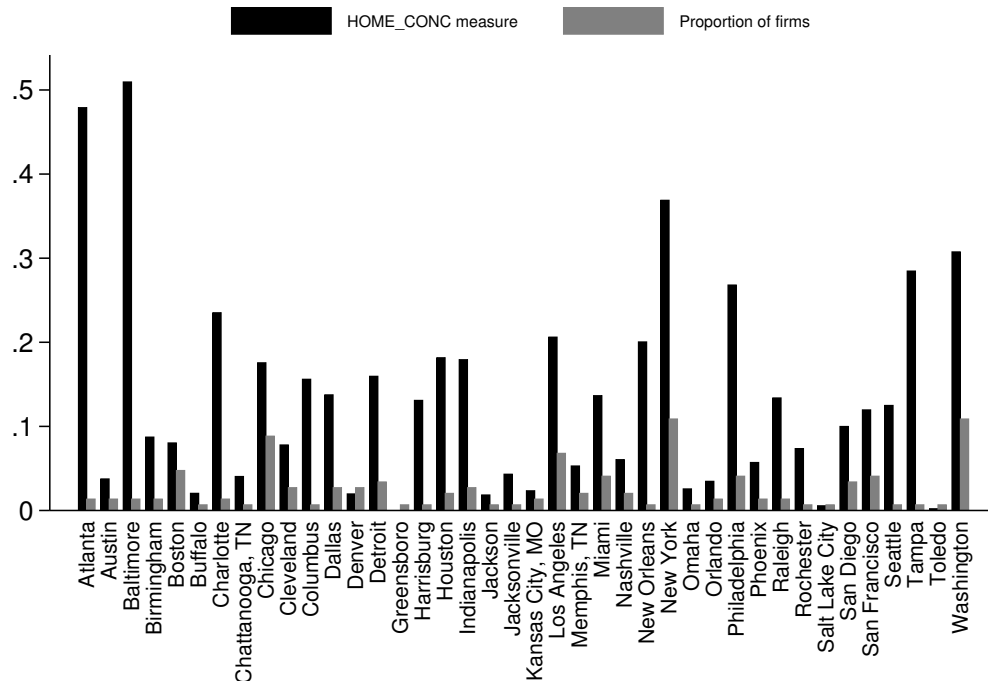
This figure displays the geographic distribution of properties at the Metropolitan Statistical Area (MSA) level. Deep grey indicates a higher number of properties located in a specific MSA.

Figure 1.3 displays the distribution of firms' headquarters by MSA and the average local asset concentration by headquarters MSA. From this figure, it is apparent that firms headquartered in Atlanta, Baltimore, New York, or Washington, DC keep on average a higher proportion of their portfolios in their headquarters MSAs. We can also observe a higher concentration of REITs with headquarters in

16. Atlanta (GA), Austin (TX), Baltimore (MD), Birmingham (AL), Boston (MA), Buffalo (NY), Charlotte (NC), Chattanooga (TN), Chicago (IL), Cleveland (OH), Columbus (OH), Dallas (TX), Denver (CO), Detroit (MI), Greensboro (NC), Harrisburg (PA), Houston (TX), Indianapolis (IN), Jackson (MS), Jacksonville (FL), Kansas City (MO), Los Angeles (CA), Memphis (TN), Miami (FL), Nashville (TN), New Orleans (LA), New York (NY), Omaha (NE), Orlando (FL), Philadelphia (PA), Phoenix (AZ), Raleigh (NC), Rochester (NY), Salt Lake City (UT), San Diego (CA), San Francisco (CA), San Jose (CA), Seattle (WA), Tampa (FL), Toledo (OH), and Washington (DC).

New York (11%), Washington, DC (11%), Chicago (9%), Los Angeles (7%), and Boston (5%).

Figure 1.3 – Average Local Asset Concentrations and Distribution of Headquarters by MSA



This figure plots the average local asset concentration by headquarter Metropolitan Statistical Area (MSA) and the distribution of headquarters locations for our sample firms at the MSA level. We use HOME_CONC measure which is defined as the percentage of a firm’s total property portfolio located in the headquarter MSA. Concentration measure is computed using the variable “adjusted cost” collected from SNL Real Estate’s database. “Proportion of firms” represents the number of firms headquartered in a specific MSA as a proportion of our total sample firms.

As shown in Table 1.1, REITs keep, on average, 20% of their properties in their headquarter MSA and 29% of their properties in the most-invested MSA. The 75 percentiles are close to these low average values, indicating that very-concentrated REITs are quite scarce¹⁷, as is demonstrated in Figure 1.4. We also observe in Table 1.1 that the average market value of a US REIT is US\$3.3 billion. Despite the lack of tax advantage, REITs have high market and book leverage compared to non-REIT firms (US non-financial firms in the Compustat annual database during 1971-2010) studied by Ogden and Wu (2013). The average market (book) leverage is 44% (62 %), while they found that non-REIT firms have an average

17. These measures can reach: SI Green Realty Corp REIT and Alexander’s Inc. REIT, both headquartered in New York with a market cap of US\$9 billion and US\$1.75 billion, respectively.

market (book) leverage of 26% (23%). The mean of market-to-book ratio is 1.41.

Table 1.1 – Summary Statistics

	mean	sd	min	p25	p50	p75	max
HOME_CONC	0.20	0.26	0.00	0.02	0.09	0.24	1.00
SINGLE_CONC	0.29	0.25	0.04	0.12	0.19	0.35	1.00
HHI	0.19	0.24	0.01	0.05	0.10	0.21	1.00
Market Value	3,333.97	5,426.51	3.25	672.95	1,647.79	3,503.69	60,163.82
Market-to-Book	1.41	0.36	0.57	1.16	1.34	1.58	3.48
Market leverage	0.44	0.11	0.24	0.36	0.43	0.52	0.83
Book leverage	0.62	0.16	0.30	0.51	0.59	0.70	0.96

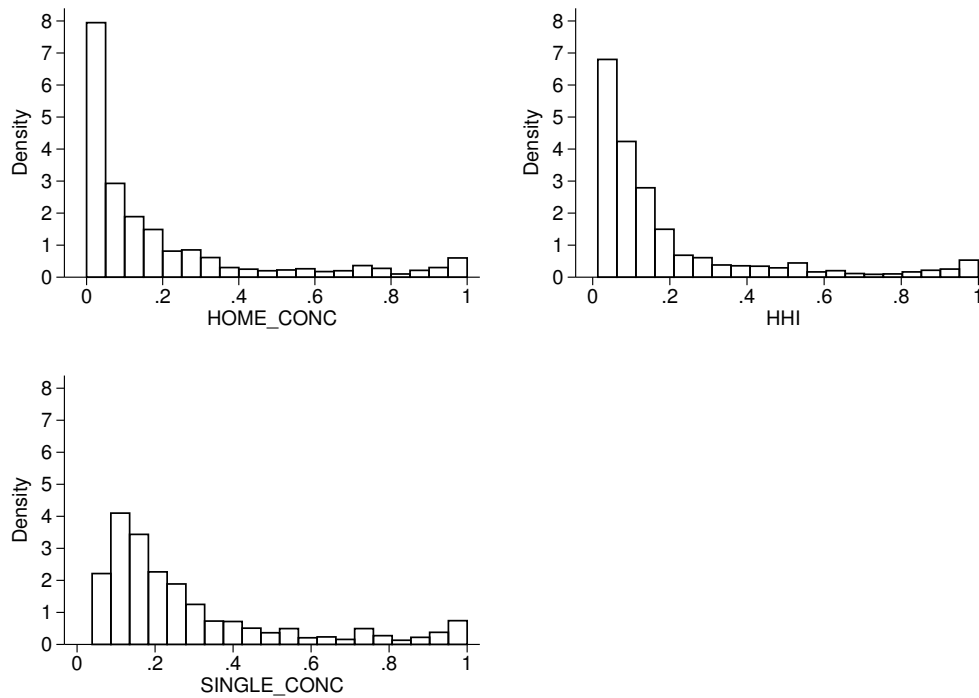
This table provides the summary statistics (mean, standard deviation (sd), min, 25th percentile, 50th percentile, 75th percentile, max) for Market Value (in US\$ million), Market-to-Book ratio, Market leverage and Book leverage and our three geographic concentration measures. HOME_CONC measure is defined as the percentage of a firm’s total property portfolio located in the headquarter market. SINGLE_CONC is defined as the largest percentage of a firm’s total property portfolio located in any market, that may include the firm’s headquarter location, within a particular year. HHI is the Herfindahl-Hirschman Index of a firm’s geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable “adjusted cost” collected from the SNL Real Estate’s database. Market Value of Equity is end-of-year price multiplied by number of shares outstanding. Market-to-Book ratio is computed as market value of equity plus book value of long-term debt to book value of common equity plus book value of long-term debt. Market leverage is book value of total debt divided by market value of equity plus book value of total debt. Book Leverage is book value of total debt divided by book value of common of equity plus book value of total debt.

To observe the time-series variation of the concentration measures, we plot the average concentration measures over time in Figure 1.5. We notice a decreasing trend between 1995 and 2017 for the three concentration measures, which means that REITs tend to expand their business in other cities and become more diversified. One possible explanation is based on the firm’s life cycle. Concentrated REITs are at their early stage and have numerous options to expand their business in other cities, whereas diversified REITs are already mature enough with the lack of options to grow. The second possible explanation is related to modern information technology. Information and communication technologies reduce the cost and complexity of distance. Perception of distance - the psychological distance - between a REIT’s assets and its headquarters has declined over the years. REITs have therefore had an incentive to expand their real estate assets into new cities.¹⁸

The correlation matrix presented in Table 1.2 reveals three strong correlations between the three geographic concentration measures. In addition, it’s not surpris-

18. This point could be used as an illustration of the slow learning process in explaining the relative decline of home bias, as observed in financial literature during the last three decades.

Figure 1.4 – Distribution of our three Geographic Concentration Measures



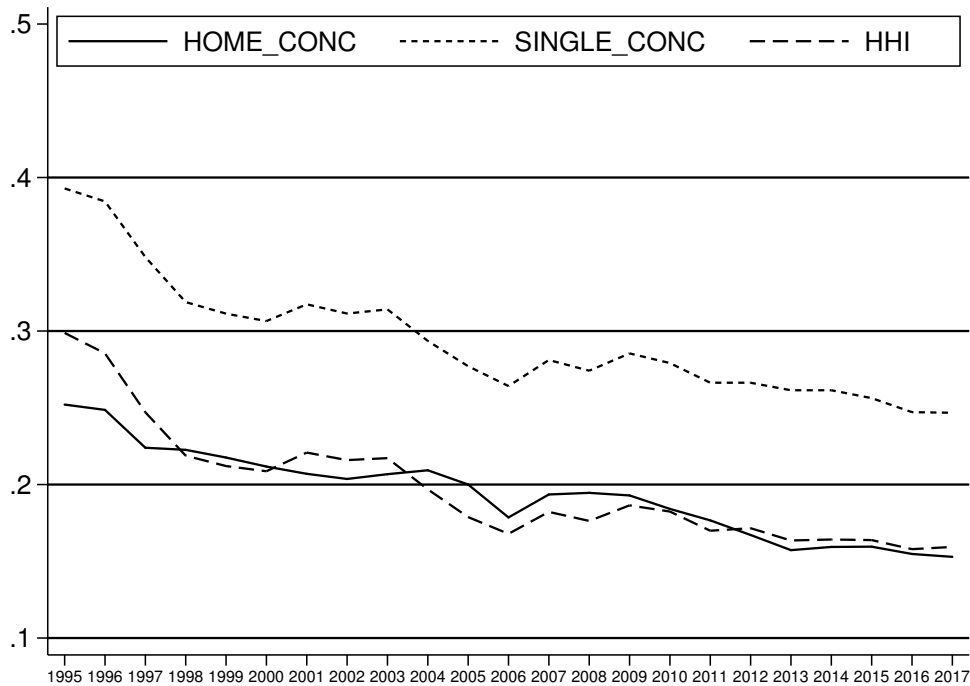
This figure displays the distribution of our three Geographic Concentration Measures. HOME_CONC measure is defined as the percentage of a firm’s total property portfolio located in the headquarter market. SINGLE_CONC is defined as the largest percentage of a firm’s total property portfolio located in any market, that may include the firm’s headquarter location, within a particular year. HHI is the Herfindahl-Hirschman Index of a firm’s geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable “adjusted cost” collected from SNL Real Estate’s database.

ing that the size (as proxied by market value) of a REIT and the three geographic concentration measures are negatively correlated. Indeed, small REITs are likely to start and concentrate their business in their headquarter MSA. As such, they tend to be more geographically concentrated than large REITs. However, the magnitude of the correlation coefficients are small (around -10 %), meaning that size is not the main driver for the better performance of concentrated REITs.

In Panel A of Table 1.3, we observe that high concentrated REITs choose to acquire, on average, a larger proportion of older properties than low concentrated REITs.¹⁹ This result is consistent with Garmaise and Moskowitz (2004), who

19. The age of a property is computed as the difference between the purchase date and the construction date of each property. We also conduct the analysis by calculating, as of each year, the age of a property as the difference between that year and the construction date of each property. The results show that concentrated REITs allocate a greater proportion of their property portfolio to older assets. For brevity, results are not reported but are available from the authors upon request.

Figure 1.5 – Time Series of Average Concentration Measures by Year



This figure plots the average concentration measures over time. The solid line represents HOME_CONC measure which is defined as the percentage of a firm’s total property portfolio located in the headquarter market. The dashed line represents SINGLE_CONC which is defined as the largest percentage of a firm’s total property portfolio located in any market, that may include the firm’s headquarter location, within a particular year. The long-dashed line represents HHI which is the Herfindahl-Hirschman Index of a firm’s geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable “adjusted cost” collected from SNL Real Estate’s database.

employed two indirect measures of information asymmetry: the distance between the buyer and the property and the age of the property. They argue that buyers located closer to a property are likely have a better understanding of local market conditions and can more easily and cheaply evaluate the property. They also add that properties with longer income and price histories provide investors with more information about the property and the local real estate market. Panel B of Table 1.3 reports that unlevered betas, β^U , increase monotonically from Low to High market-to-book ratio (from 0.347 to 0.372), while betas decrease from 0.662 to 0.59. This result is not inconsistent with Fama and French (1992), who find that firms with low ratios of market-to-book equity have higher expected stock returns. We analyze the relation between unlevered betas and firms’ market-to-book ratios, whereas Fama and French (1992) focus on the relation between equity betas and

Table 1.2 – Correlation Matrices between Market Value and the Geographic Concentration Measures of REITs

	Market Value	HOME_CONC	SINGLE_CONC	HHI
Market Value	1			
HOME_CONC	-0.102***	1		
SINGLE_CONC	-0.102***	0.838***	1	
HHI	-0.0949***	0.826***	0.980***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table presents the correlation matrices between Market Value and the three different geographic concentration measures. Market Value is the end-of-year price multiplied number of shares outstanding. HOME_CONC measure is defined as the percentage of a firm's total property portfolio located in the headquarter market. SINGLE_CONC is defined as the largest percentage of a firm's total property portfolio located in any market, which may include the firm's headquarter location, within a particular year. HHI is the Herfindahl-Hirschman Index of a firm's geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable "adjusted cost" collected from SNL Real Estate's database.

equity market-to-book. There is a stronger positive relation between unlevered betas, β^U , and firms' market-to-book ratios because long-term debt to market value of equity (D/E) and market-to-book measures are negatively correlated.²⁰ D/E ratio decreases monotonically from 1.028 for the Low market-to-book ratio to 0.63 for the High market-to-book ratio. In line with previous literature (Myers, 1977; Barclay et al., 1995; Ogden and Wu, 2013), we document a negative relation between market leverage and market-to-book ratio. Market leverage decreases monotonically from 0.504 for the Low market-to-book ratio to 0.386 for the High market-to-book ratio. For REITs, book leverage is positively related to market-to-book ratio. At first glance, this point may seem inconsistent with Barclay et al. (2006), who find a negative relation between book leverage and growth options (excluding REITs). Feng et al. (2007) attribute this stylized fact to the special regulatory environment of REITs. We now focus on the effect of asset concentration. As shown in Panel C of Table 1.3, betas and unlevered betas increase monotonically from Low to High geographic concentration for each concentration measure. Concentrated firms have higher, levered or unlevered betas than non-concentrated firms. For the data, we use Fama-French factors on a monthly basis

20. The unlevered beta is derived from Hamada (1972) equation: $\beta_{f,t}^U = \frac{\beta_{f,t}}{1 + \frac{D_{f,t}}{E_{f,t}}}$. A lower D/E ratio (associated to a higher market-to-book) implies a higher unlevered beta.

extracted from Wharton Research Data Services (WRDS). Firms' financial data are from the CRSP/Compustat Merged Database for the period from 1990 to 2017. We use a five-year rolling window. Therefore, results are reported from 1995. In addition to the full sample period (1995-2017), we also examine the periods: (i) 2002-2007, including the REIT maturity era up to the Global Financial Crisis, (ii) 2002-2017, covering the REIT maturity era, and (iii) 2009-2017, the post global financial crisis period.²¹

21. For this decomposition in subperiods, see also Cakici et al. (2014), Ambrose et al. (2007a), and Tirtiroglu et al. (2017).

Table 1.3 – Descriptive Statistics of Portfolios sorted by Market-to-Book Ratio and Geographic Concentration Measures

Panel A: Portfolio allocation by the age of the property for our sample firms												
HOME_CONC					SINGLE_CONC					HHI		
Age (in years)	Low	Mid	High	High-Low	Low	Mid	High	High-Low	Low	Mid	High	High-Low
≤ 5	0.35	0.34	0.24	-0.11***	0.38	0.28	0.26	-0.12***	0.38	0.28	0.27	-0.11***
p-value				0.00				0.00				0.00
Between 6 and 10	0.18	0.18	0.15	-0.03***	0.18	0.17	0.17	-0.01	0.17	0.18	0.17	0.00
p-value				0.00				0.23				0.30
> 10	0.47	0.49	0.61	0.14***	0.44	0.55	0.57	0.13***	0.45	0.55	0.57	0.12***
p-value				0.00				0.00				0.00

Panel B: Market-to-Book Ratio										
	Low	Mid	High		Low	Mid	High		Low	High
Market Value	1723.082	3460.54	4787.328							
D/E	1.028	0.808	0.63							
Market leverage	0.504	0.441	0.386							
Book leverage	0.588	0.623	0.693							
Beta	0.662	0.595	0.59							
UnleveredBeta	0.347	0.352	0.372							

Panel C: Geographic Concentration Measures												
HOME_CONC					SINGLE_CONC					HHI		
Beta	Low	Mid	High	High-Low	Low	Mid	High	High-Low	Low	Mid	High	High-Low
Beta	0.561	0.634	0.654	0.598	0.614	0.637	0.589	0.612	0.647			
UnleveredBeta	0.328	0.369	0.374	0.346	0.362	0.362	0.34	0.361	0.37			

Panel A reports, on average, the portfolio allocation of our sample firms by the age of the property at the time of purchase (computed as the difference between the purchase date and the construction date of each property). We sort firms into three equal groups (Low, Mid, and High) based on each of the three geographic measures as of each year. Panel B reports descriptive statistics of portfolios sorted by Market-to-Book Ratio. We sort firms into three equal groups (Low, Mid, and High) based on their market-to-book ratio, computed as the ratio of market value of equity plus book value of long-term debt to book value of common equity plus book value of long-term debt. Market Value of Equity is end-of-year price multiplied number of shares outstanding (in US\$ million). D/E is long-term debt to market value of equity. Market leverage is book value of total debt divided by market value of equity plus book value of total debt. Book Leverage is book value of total debt divided by book value of common of equity plus book value of total debt. We estimate monthly equity betas using a five-year rolling CAPM (three-year minimum). We then compute the average beta of each firm, every year, using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered beta. Panel C reports the averages of firms' betas and unlevered betas. We sort firms into three equal groups (Low, Mid, and High) based on each of the three geographic measures as of each year. HOME_CONC measure is defined as the percentage of a firm's total property portfolio located in the headquarter market. SINGLE_CONC is defined as the largest percentage of a firm's total property portfolio located in any market, that may include the firm's headquarter location, within a particular year. HHI is the Herfindahl-Hirschman Index of a firm's geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable "adjusted cost" collected from SNL Real Estate's database. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

1.4 Empirical Results

Table 1.4 reports the averages of β^U for firms sorted into Low, Mid, and High market-to-book ratio. We present the results for concentrated, non-concentrated, and all sample equity REITs across various subperiods. As can be seen from the table, β^U increase slightly from the Low to the High market-to-book ratio. Firms with higher growth opportunities (high market-to-book ratio) tend to have higher β^U than firms with low growth opportunities (low market-to-book ratio). While there's no statistically significant difference in β^U between high and low market-to-book ratios for non-concentrated REITs, we observe a statistically significant difference for the concentrated ones. For example, during 2002-2017 (using the HOME_CONC measure), the difference in β^U for concentrated REITs is 0.06 (=0.46 - 0.40). This implies a higher cost of capital for a project of a concentrated firm with high growth opportunities. We also observe that β^U for concentrated and non-concentrated REITs during 2009-2017 were about four times the β^U during 2002-2007. This result is consistent with that of Morri and Romito (2017), who showed that REITs equity beta witnessed a sharp increase in conjunction with the Global Financial Crisis.

Table 1.4 – Average of Firms’ Unlevered Beta, β^U , by Different Geographical Concentration Measures and by Different Subperiods

	1995-2017						2002-2007						2002-2017						2009-2017					
	(Full sample period)						(excluding GFC)						(REIT maturity era)						(Post-GFC)					
	Low	Mid	High	Diff	Low	Mid	High	Diff	Low	Mid	High	Diff	Low	Mid	High	Diff	Low	Mid	High	Diff				
<i>All sample REITs</i>	0.35	0.35	0.37	0.02	0.12	0.16	0.15	0.03*	0.40	0.41	0.43	0.03	0.40	0.41	0.43	0.03	0.58	0.57	0.62	0.04*				
<i>p-value</i>	0.16						0.06						0.11						0.09					
	<i>HOME_CONC</i>						<i>HOME_CONC</i>						<i>HOME_CONC</i>						<i>HOME_CONC</i>					
<i>Concentrated REITs</i>	0.35	0.37	0.40	0.05**	0.13	0.17	0.17	0.04*	0.40	0.43	0.46	0.06**	0.40	0.43	0.46	0.06**	0.58	0.61	0.66	0.08***				
<i>p-value</i>	0.04						0.06						0.02						0.007					
<i>Non-concentrated REITs</i>	0.34	0.34	0.35	0.01	0.11	0.16	0.13	0.02	0.39	0.39	0.40	0.01	0.39	0.39	0.40	0.01	0.58	0.54	0.58	0.005				
<i>p-value</i>	0.77						0.42						0.77						0.82					
	<i>SINGLE_CONC</i>						<i>SINGLE_CONC</i>						<i>SINGLE_CONC</i>						<i>SINGLE_CONC</i>					
<i>Concentrated REITs</i>	0.35	0.36	0.39	0.04*	0.09	0.16	0.17	0.08***	0.41	0.42	0.45	0.04*	0.41	0.42	0.45	0.04*	0.63	0.59	0.64	0.01				
<i>p-value</i>	0.09						0.001						0.07						0.72					
<i>Non-concentrated REITs</i>	0.34	0.34	0.36	0.02	0.15	0.16	0.14	-0.01	0.38	0.40	0.41	0.03	0.38	0.40	0.41	0.03	0.53	0.56	0.60	0.07				
<i>p-value</i>	0.34						0.55						0.21						0.14					
	<i>HHI</i>						<i>HHI</i>						<i>HHI</i>						<i>HHI</i>					
<i>Concentrated REITs</i>	0.35	0.36	0.39	0.04*	0.09	0.16	0.17	0.08***	0.41	0.42	0.45	0.04*	0.41	0.42	0.45	0.04*	0.63	0.59	0.63	0.003				
<i>p-value</i>	0.10						0.001						0.08						0.89					
<i>Non-concentrated REITs</i>	0.34	0.35	0.36	0.02	0.15	0.16	0.14	-0.01	0.38	0.40	0.42	0.04	0.38	0.40	0.42	0.04	0.53	0.56	0.60	0.07				
<i>p-value</i>	0.23						0.74						0.27						0.22					

This table reports the averages of firms’ unlevered betas, β^U . We sort firms into two equal groups (concentrated and non-concentrated) based on each of the three geographic measures as of each year. *HOME_CONC* measure is defined as the percentage of a firm’s total property portfolio located in the headquarter market. *SINGLE_CONC* is defined as the largest percentage of a firm’s total property portfolio located in any market, that may include the firm’s headquarter location, within a particular year. *HHI* is the Herfindahl-Hirschman Index of a firm’s geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable “adjusted cost” collected from SNL Real Estate’s database. We estimate monthly equity betas using a five-year rolling CAPM (three-year minimum). We then compute the average beta of each firm, every year, using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered beta. As of each year, we sort the sample REITs into three equal groups (Low, Mid, and High) based on their firm’s market-to-book ratio, computed as the ratio of market value of equity plus book value of long-term debt to book value of common equity plus book value of long-term debt. The averages of firms’ unlevered betas and their mean differences between High and Low market-to-book firms are reported for concentrated, non-concentrated, and all sample equity REITs across different subperiods.

*** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

Some striking results in Table 1.5 should be highlighted. Firstly, regarding β^{AIP} , we do not observe an important difference across concentrated and non-concentrated portfolios, whereas we observe large and statistically significant differences for β^{GO} : (i) 0.458 versus 0.368 during 1995-2017 (SINGLE_CONC), (ii) 0.788 versus 0.576 during 2009-2017 (HOME_CONC), and (iii) 0.314 versus 0.161 during 2002-2007 (HHI). This suggests that the unlevered betas' differences across concentrated and non-concentrated portfolios (reported in Tables 1.3 and 1.4) come from growth options betas and not from assets-in-place betas. Secondly, as reported in Table 1.5, the results shed a new light on the hypothesis of $\beta_t^{AIP} < \beta_t^{GO}$, put forward by Tirtiroglu et al. (2017) for the REIT industry. Our findings make a noteworthy contribution to current literature by providing strong evidence that this hypothesis is only valid for concentrated REITs that exhibit higher risks and expected returns.

The means of $(\beta_t^{GO} - \beta_t^{AIP})$ are highly statistically significant for concentrated REITs across all different periods (except for HOME_CONC during 2002-2007, for SINGLE_CONC, and for HHI during 2009-2017). The differences in the average beta of GO and the average beta of AIP for the concentrated sample range from 0.132 (1995-2017) to 0.241 (2009-2017). Interestingly, the means of $(\beta_t^{GO} - \beta_t^{AIP})$ for non-concentrated REITs are insignificant for all time periods, confirming our previous results. However, there are few exceptions for the 2009-2017 subperiod. We notice that concentrated portfolios do not have higher β^{GO} than non-concentrated ones (using SINGLE_CONC or HHI measures). This high β^{GO} for non-concentrated REITs during the 2009-2017 period could be explained by the overvaluation of the listed real estate market as reported by Van Nieuwerburgh (2019a). He argues that, for the last seven years of his sample (2009-2016), the price of listed real estate stocks had been unusually high relative to dividends. The market had priced in future income growth on commercial properties that was far above the growth rates seen in the data. Van Nieuwerburgh (2019a) also stated that the market looked just as “frothy” in July 2016 as it had in February 2007. Moreover, we should add that the HOME_CONC measure seems particularly relevant to study the impact of geographic concentration on growth options. For this

measure, the means of $(\beta_t^{GO} - \beta_t^{AIP})$ for concentrated REITs are the largest and the most statistically significant during 1995–2017, 2002–2017, and 2009–2017. This implies that asset concentration in the headquarters MSA contributes to better information on local growth opportunities.

Table 1.5 – Growth Options and Assets-in-Place Betas and their Mean Differences by Geographical Concentration and by Different Subperiods

	1995-2017 (Full sample period)			2002-2007 (excluding GFC)			2002-2017 (REIT maturity era)			2009-2017 (Post-GFC)		
	GO	AIP	Diff	GO	AIP	Diff	GO	AIP	Diff	GO	AIP	Diff
	<i>All sample REITs</i>			<i>All sample REITs</i>			<i>All sample REITs</i>			<i>All sample REITs</i>		
<i>p-value</i>	0.417	0.322	0.096	0.240	0.113	0.127	0.515	0.390	0.125	0.673	0.571	0.102
		0.122		0.224			0.134				0.452	
	<i>HOME_CONC</i>			<i>HOME_CONC</i>			<i>HOME_CONC</i>			<i>HOME_CONC</i>		
<i>Concentrated REITs</i>	0.457	0.309	0.148***	0.275	0.115	0.159	0.587	0.379	0.208***	0.788	0.547	0.241**
<i>p-value</i>		0.004		0.134			0.004			0.034		
<i>Non-concentrated REITs</i>	0.376	0.331	0.044	0.200	0.115	0.085	0.438	0.401	0.037	0.576	0.588	-0.012
<i>p-value</i>		0.610		0.422			0.719			0.944		
	<i>SINGLE_CONC</i>			<i>SINGLE_CONC</i>			<i>SINGLE_CONC</i>			<i>SINGLE_CONC</i>		
<i>Concentrated REITs</i>	0.458	0.318	0.140**	0.311	0.080	0.231**	0.553	0.402	0.151*	0.679	0.616	0.062
<i>p-value</i>		0.032		0.036			0.082			0.632		
<i>Non-concentrated REITs</i>	0.368	0.326	0.042	0.154	0.152	0.002	0.488	0.374	0.114	0.679	0.520	0.159
<i>p-value</i>		0.569		0.989			0.188			0.260		
	<i>HHI</i>			<i>HHI</i>			<i>HHI</i>			<i>HHI</i>		
<i>Concentrated REITs</i>	0.448	0.317	0.132**	0.314	0.074	0.240**	0.544	0.399	0.144*	0.655	0.619	0.036
<i>p-value</i>		0.028		0.027			0.071			0.744		
<i>Non-concentrated REITs</i>	0.376	0.327	0.049	0.161	0.150	0.010	0.498	0.374	0.123	0.710	0.513	0.197
<i>p-value</i>		0.535		0.919			0.199			0.224		

This table reports the averages of growth options (*GO*) and assets-in-place (*AIP*) betas and the mean differences (*Diff*) between them for concentrated, non-concentrated, and all sample equity REITs across different subperiods. We sort firms into two equal groups (concentrated and non-concentrated) based on each of the three geographic measures as of each year. *HOME_CONC* measure is defined as the percentage of a firm's total property portfolio located in the headquarter market. *SINGLE_CONC* is defined as the largest percentage of a firm's total property portfolio located in any market, that may include the firm's headquarter location, within a particular year. *HHI* is the Herfindahl-Hirschman Index of a firm's geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable "adjusted cost" collected from SNL Real Estate's database. We estimate monthly equity betas using a five-year rolling CAPM (three-year minimum). We then compute the average beta of each firm, every year, using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered beta. *GO* and *AIP* betas are computed for each of the concentrated and non-concentrated group, every year, using the averages of unlevered betas and firms' book value of assets (*B/M*) ratio of two portfolios of firms created based on their *B/M* ratios. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

A large and growing body of literature has investigated the role of geographical proximity in finance (Coval and Moskowitz, 1999, 2001; Garmaise and Moskowitz, 2004; Van Nieuwerburgh and Veldkamp, 2009; Giroud, 2013). These authors have found that investors are biased toward investing in local stocks due to information advantage. Our results provide interesting insights into the relation between geographic concentration and a firm’s ability to exploit growth options. We show that geographically concentrated firms may be more able to exploit future growth opportunities than non-concentrated firms thanks to information advantage. Growth options rather than assets-in-place are indeed important components of concentrated REITs’ valuations. Our results report a higher impact of growth opportunities on the beta for geographically concentrated firms. In addition, using the social network database of BoardEx, we have measured each REIT’s level of connectedness through the average number of connections of a REIT’s board members. As a particularly noteworthy result, we observe that the means of $(\beta_t^{GO} - \beta_t^{AIP})$ are highly statistically significant for the most geographically concentrated and connected REITs (Table A2). These results are consistent with Cashman et al. (2018) who argue that a well-connected real estate firm might perform better because its managers learn about properties, potential deals, and/or tenant desires before their competitors. They also found that connections, which allow access to better or more timely information, could easily translate into better dealmaking. Our results are also consistent with Larcker et al. (2013) who found that the relation between board connectedness and future firm performance was more pronounced among firms with high growth opportunities. They also detailed in their paper the potential benefits of having well-connected boards.

1.5 Robustness checks

1.5.1 Choice of Split: Sorting Firms into Three Portfolios

We produce further evidence to demonstrate that these results are robust to the choice of split between the concentrated and non-concentrated portfolios, by sorting firms into three terciles (High concentrated, Mid concentrated, and Low concentrated), based on each of the three geographic measures. β_t^{GO} and β_t^{AIP}

are computed using the previously described methodology. Results reported in Table 1.6 are quite revealing in several ways. Firstly, the means of $(\beta_t^{GO} - \beta_t^{AIP})$ are highly statistically significant for high concentrated REITs across all different periods, (except for SINGLE_CONC and HHI during 2009-2017). Secondly, the means of $(\beta_t^{GO} - \beta_t^{AIP})$ for mid concentrated and low concentrated REITs are insignificant for all time periods, confirming our previous results. Thirdly, regarding β^{AIP} , we do not observe major differences across high concentrated and low concentrated portfolios, whereas we observe large significant differences for β^{GO} : (i) 0.479 versus 0.344 during 1995-2017 (HHI), (ii) 0.728 versus 0.615 during 2009-2017 (HOME_CONC), (iii) 0.572 versus 0.48 during 2002-2017 (SINGLE_CONC), and (iv) 0.326 versus 0.14 during 2002-2007 (SINGLE_CONC). Lastly, β^{GO} decrease monotonically from high to low concentrated portfolios of REITs across all geographic concentration measures and different periods (except for HHI).

Table 1.6 – Robustness Check: Growth Options and Assets-in-Place Betas and their Mean Differences by Geographical Concentration and by Different Subperiods - Firms sorted into three Terciles

1995-2017		2002-2007		2002-2017		2009-2017						
(Full sample period)		(excluding GFC)		(REIT maturity era)		(Post-GFC)						
GO	AIP Diff	GO	AIP Diff	GO	AIP Diff	GO	AIP Diff					
<i>HOME_CONC</i>		<i>HOME_CONC</i>		<i>HOME_CONC</i>		<i>HOME_CONC</i>						
<i>High</i>	0.413	0.331	0.082**	0.264	0.117	0.147*	0.549	0.407	0.143***	0.728	0.597	0.131*
<i>p-value</i>			0.040			0.066			0.005			0.088
<i>Mid</i>	0.396	0.346	0.050	0.190	0.148	0.043	0.516	0.405	0.111	0.709	0.567	0.142
<i>p-value</i>			0.609			0.701			0.407			0.545
<i>Low</i>	0.386	0.308	0.078	0.210	0.101	0.109	0.489	0.351	0.138	0.615	0.525	0.090
<i>p-value</i>			0.282			0.338			0.135			0.490
<i>SINGLE_CONC</i>		<i>SINGLE_CONC</i>		<i>SINGLE_CONC</i>		<i>SINGLE_CONC</i>						
<i>High</i>	0.474	0.313	0.161***	0.326	0.076	0.250**	0.572	0.373	0.199***	0.707	0.570	0.137
<i>p-value</i>			0.005			0.022			0.005			0.162
<i>Mid</i>	0.388	0.325	0.063	0.210	0.105	0.105	0.486	0.418	0.068	0.650	0.628	0.022
<i>p-value</i>			0.455			0.390			0.526			0.901
<i>Low</i>	0.345	0.332	0.013	0.140	0.166	-0.026	0.480	0.373	0.107	0.615	0.525	0.090
<i>p-value</i>			0.872			0.813			0.313			0.490
<i>HHI</i>		<i>HHI</i>		<i>HHI</i>		<i>HHI</i>						
<i>High</i>	0.479	0.319	0.160**	0.288	0.100	0.188**	0.590	0.379	0.211***	0.764	0.568	0.196
<i>p-value</i>			0.015			0.034			0.010			0.136
<i>Mid</i>	0.383	0.328	0.055	0.321	0.078	0.244	0.477	0.425	0.052	0.560	0.654	-0.093
<i>p-value</i>			0.509			0.113			0.606			0.523
<i>Low</i>	0.344	0.323	0.020	0.094	0.173	-0.079	0.500	0.357	0.143	0.759	0.465	0.294
<i>p-value</i>			0.811			0.431			0.186			0.112

This table reports the averages of growth options (*GO*) and assets-in-place (*AIP*) betas and the mean differences (*Diff*) between them for our sample equity REITs across different subperiods. We sort firms into three terciles (*High concentrated*, *Mid concentrated*, and *Low concentrated*) based on each of the three geographic measures as of each year. *HOME_CONC* measure is defined as the percentage of a firm's total property portfolio located in the headquarter market. *SINGLE_CONC* is defined as the largest percentage of a firm's total property portfolio located in any market, that may include the firm's headquarter location, within a particular year. *HHI* is the Herfindahl-Hirschman Index of a firm's geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable "adjusted cost" collected from SNL Real Estate's database. We estimate monthly equity betas using a five-year rolling CAPM (three-year minimum). We then compute the average beta of each firm, every year, using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered beta. *GO* and *AIP* betas are computed, every year, for each of the three groups (*High concentrated*, *Mid concentrated*, and *Low concentrated*) using the averages of unlevered betas and firms' book value of assets to market value of assets (*B/M*) ratio of two portfolios of firms created based on their *B/M* ratios. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

1.5.2 Results by REITs Subsector

We check the robustness of our findings for the REIT industry by splitting our sample into four real estate subsectors: Office, Retail, Residential and Other. For each concentration measure we have also considered three levels of concentration (based on terciles: High, Mid, and Low). Thus, we have 12 categories for each concentration measure, highlighting the relevance of our approach. For each of the four subsectors, **GO** and **AIP** betas are computed, every year, for each of the three groups (High concentrated, Mid concentrated, and Low concentrated) using the averages of unlevered betas and firms' book value of assets to market value of assets (B/M) ratio, of two portfolios of firms created based on their B/M ratios. Our results reported in Table 1.7 confirm our previous findings that the beta of growth options is significantly greater than the beta of assets-in-place for REITs with higher geographic concentration across different subsectors and geographic concentration measures. However, there is an exception for the Retail subsector (using HOME_CONC measure), where we observe that beta of growth options is significantly greater than the beta of assets-in-place for the mid concentrated but not for the high concentrated portfolio.²²

22. We thank an anonymous referee for giving us the opportunity to present this relevant decomposition.

Table 1.7 – Robustness Check: Growth Options and Assets-in-Place Betas and their Mean Differences by Subsector and by Geographical Concentration

Sub-Sector	Level of concentration	HOME_CONC			SINGLE_CONC			HHI		
		GO	AIP	Difference	GO	AIP	Difference	GO	AIP	Difference
Office	High	0.68	0.34	0.34**	0.68	0.34	0.34**	0.67	0.32	0.35**
	p-value			0.014			0.014			0.012
	Mid	0.39	0.39	0.01	0.54	0.36	0.18	0.53	0.37	0.17
	p-value			0.975			0.159			0.217
	Low	0.35	0.30	0.05	0.40	0.32	0.08	0.40	0.33	0.07
p-value			0.733			0.667			0.666	
Retail	High	0.38	0.32	0.06	0.40	0.27	0.12*	0.41	0.26	0.15**
	p-value			0.303			0.051			0.017
	Mid	0.61	0.18	0.43***	0.32	0.29	0.03	0.38	0.29	0.09
	p-value			0.003			0.819			0.438
	Low	0.51	0.34	0.17	0.49	0.35	0.14	0.47	0.33	0.14
p-value			0.165			0.216			0.188	
Residential	High	0.76	0.11	0.65*	0.72	0.20	0.53*	0.77	0.11	0.66**
	p-value			0.083			0.069			0.033
	Mid	0.50	0.19	0.32	0.56	0.12	0.44	0.59	0.15	0.43
	p-value			0.112			0.113			0.109
	Low	0.49	0.19	0.30*	0.45	0.17	0.28**	0.37	0.20	0.17
p-value			0.082			0.048			0.144	
Other	High	0.49	0.36	0.17**	0.55	0.34	0.21***	0.50	0.32	0.18*
	p-value			0.016			0.010			0.062
	Mid	0.32	0.40	-0.08	0.54	0.39	0.14	0.50	0.37	0.14
	p-value			0.633			0.167			0.190
	Low	0.49	0.35	0.14	0.52	0.29	0.23	0.44	0.32	0.11
p-value			0.200			0.217			0.392	

This table reports the averages of growth options (GO) and assets-in-place (AIP) betas and the mean differences (Diff) between them for our sample equity REITs subsectors during the full sample period. We sort firms into three terciles (High concentrated, Mid concentrated, and Low concentrated) based on each of the three geographic measures as of each year. HOME_CONC measure is defined as the percentage of a firm's total property portfolio located in the headquarter market. SINGLE_CONC is defined as the largest percentage of a firm's total property portfolio located in any market, that may include the firm's headquarter location, within a particular year. HHI is the Herfindahl-Hirschman Index of a firm's geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable "adjusted cost" collected from SNL Real Estate's database. We estimate monthly equity betas using a five-year rolling CAPM (three-year minimum). We then compute the average beta of each firm, every year, using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered betas. For each of the four subsectors, GO and AIP betas are computed, every year, for each of the three groups (High concentrated, Mid concentrated, and Low concentrated) using the averages of unlevered betas and firms' book value of assets to market value of assets (B/M) ratio of two portfolios of firms created based on their B/M ratios. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

1.5.3 The Dumitrescu–Hurlin panel causality test between Growth Options and Geographic Concentration Measures

Table 1.8 presents the Dumitrescu–Hurlin panel causality test results between growth options (proxied by Market-to-Book ratio) and geographic concentration measures as a robustness check of our main results. In the case of using SINGLE_CONC or HHI as a measure, results in Table 1.8 indicate there is a bidirectional link between growth options and geographic concentration. However, when geographic concentration is measured by HOME_CONC, the Dumitrescu–Hurlin causality test results suggest there is only an unidirectional causal link running from geographic concentration to growth options. These results suggest that the exploitation of growth options may be a valid explanation for the home bias in the REIT industry. Indeed, these detailed results, reported as robustness checks, tend to confirm that home bias (or high geographic concentration) in the REIT industry could be reasonably explained by the ability of high concentrated REITs (across different real estate subsectors) to exploit growth options.

Table 1.8 – Robustness Check: Pairwise Dumitrescu-Hurlin Panel Causality Tests

Null Hypothesis	W-Stat.	Zbar-Stat.	Prob.
HOME_CONC does not homogeneously cause Market-to-Book	1.86495**	2.29182**	0.0219
Market-to-Book does not homogeneously cause HOME_CONC	1.65392	1.51025	0.1310
SINGLE_CONC does not homogeneously cause Market-to-Book	2.29237***	3.87485***	0.0001
Market-to-Book does not homogeneously cause SINGLE_CONC	2.59513***	4.99615***	0.0000
HHI does not homogeneously cause Market-to-Book	2.97602***	6.40684***	0.0000
Market-to-Book does not homogeneously cause HHI	1.84656**	2.22371**	0.0262

This table reports the Dumitrescu–Hurlin panel causality test results between growth options provided by Market-to-Book ratio and concentrations measures. HOME_CONC measure is defined as the percentage of a firm’s total property portfolio located in the headquarter market. SINGLE_CONC is defined as the largest percentage of a firm’s total property portfolio located in any market, that may include the firm’s headquarter location, within a particular year. HHI is the Herfindahl-Hirschman Index of a firm’s geographic property portfolio concentration, including investments in their headquarter market. Concentration measures are computed using the variable “adjusted cost” collected from the SNL Real Estate’s database. Market-to-Book ratio is computed as the ratio of market value of equity plus book value of long-term debt to book value of common equity plus book value of long-term debt.

****, **, * indicate rejection of the null hypothesis at 0.01, 0.05 and 0.1 levels of significance.*

1.6 Conclusion

This article revisits the home bias puzzle. The purpose of this study is to analyze the economic effects of ownership distance on real estate returns. We use real options, more specifically growth options, to shed new light on the puzzle of local asset concentration within the context of real estate investment trusts (REITs).

We have used data for 61,920 properties purchased or sold by 148 US equity REITs over the 1995 to 2017 period from SNL Real Estate's database. We have then computed three yearly time-varying geographic concentration measures to determine the proportion of the properties held in the geographic area (MSA) in which the REIT is headquartered and the concentration of its assets across all of the MSAs. We have further investigated the impact of the geographic concentration on the firm's ability to extract growth options. We have followed the identification methodology used by Bernardo et al. (2007) and Tirtiroglu et al. (2017) that shows how to decompose a firm's beta into its beta of growth options and its beta of assets-in-place.

The results of this study report that the beta of growth options is statistically and significantly higher than the beta of assets-in-place for REITs with higher geographic concentration. We also find that the unlevered betas differences between concentrated and non-concentrated REITs come essentially from growth options betas and not from assets-in-place betas. Concentrated REITs carry more risk and more opportunities (options and real options are leveraged assets). These results are confirmed when we take into account real estate subsectors (Office, Retail, Residential, and Other) and are robust to the choice of split between geographically concentrated and non-concentrated REITs. Growth options rather than assets-in-place seem to be important components of concentrated REITs' valuations. The decomposition of a firm's beta assumes a linear relationship in risk. This assumption might be addressed in further studies by considering non-linear risk and suggesting new modelling for growth options.

Chapter 2

Financialisation and participation in the metropolisation dynamics of European-listed property companies[†]

Abstract

This article aims to explore the relationship between the financialisation dynamics of listed property companies (LPCs) and their participation in the metropolisation dynamics, in ten European countries between 2000 and 2017. The study takes place in a context of globalised real estate markets and modification of traditional urban economics. In this study, the measure of financialisation corresponds to a beta increase, in the sense of the capital asset pricing model, and is corroborated by an informativeness index. LPC-owned properties are classified along two spatial segmentations. Panel models are used to analyse the relation between financial and urban hierarchies (through building arbitrages). We find that financialisation is generally associated with a decrease in the number of assets owned, especially in the Netherlands and the UK, whereas non-financialised companies tend to increase their number of assets, especially in “flight to quality” countries such as Germany and Switzerland. In the first case, non-urban spaces and small and medium urban areas are arbitrated in favour of urban cores and metropolises. In the second, investments are reallocated towards hinterlands and the lower segments of the urban hierarchy. Over the study period, the parallelism between the

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financial hierarchy and the urban hierarchy was reinforced. Spain illustrates the risks of this evolution, whereas Sweden and Belgium present specificities. Overall, this article illustrates how LPCs function as transmitting channels in the new spatial and urban organisation.

Keywords: Financialisation; Listed property companies; Metropolisation; Europe; Urban hierarchy.

2.1 Introduction

Over the past 20 years, the concept of metropolisation has become increasingly important in urban and regional scholarly literature and has often been associated with the concept of financialisation. However, what financialisation of the urban environment means is often unclear and needs to be defined (Lizieri and Pain, 2014; Halbert et al., 2014b; Aalbers, 2019). The main objective of this study is to explore the relationship between the financialisation dynamics of European listed property companies (LPCs) and their participation in metropolisation dynamics through their spatial arbitrages. The study period, 2000–2017, is characterised by heterogeneous globalisation of real estate markets, changes in the business environment and an important evolution of the traditional urban economics.

Contemporary to urban financialisation is the implementation of the new real estate investment trust (REIT) regimes. By broadening the investor base, these regimes have allowed more funds to be invested into the urban market over the past two decades. If real estate is often considered an alternative asset class, then it nevertheless presents the interesting diversification feature of having a low correlation with other markets. However, location biases may also affect institutional investors' investment decisions. These biases might generate over-investments, for instance, in international financial centres, which are generally believed to provide the highest risk-adjusted expected returns (Lizieri and Pain, 2014; Henneberry and Mouzakis, 2014). In this context, we may state that LPCs' investment strategies contribute to reshaping the geography of commercial real estate investment and accelerating the metropolisation process, assuming that LPCs tend to adopt geographical allocation strategies that are aligned with institutional investors' location preferences.

In this study, the concept of financialisation is based on the capital asset pricing model (CAPM), which is the foundation of modern finance theory and consists of a financial integration measure. From the SNL Real Estate database, we define a sample of 99 LPCs that own buildings in ten European countries. We observe a

heterogeneous increase of their financial integration and document how these variations can be placed in relation to their participation in metropolisation dynamics through their strategic building arbitrages. The definition of financialisation is also confirmed at the microeconomic level by examining various financial criteria and the link with informativeness. Robust econometric checks of the reallocation towards metropolises over the financialisation of LPCs are reported.

The article is organised as follows. Section 2.2 offers a literature review of the evolution of LPCs in Europe, the metropolisation dynamics and the globalisation of the real estate markets. Section 2.3 is devoted to the methodology, the data set and the nomenclature of spatial units. Section 2.4 reports the results at the spatial and firm levels and discusses various robustness checks. Section 2.5 concludes by highlighting our main findings.

2.2 Literature review

2.2.1 Contemporaneous transformation of the European real estate investment trust sector

A REIT is a listed company that owns and manages income-producing properties. REITs represent an indirect way of investing; however, in the literature, they are considered to be strongly related to direct investments and to correctly mirror real estate dynamics (Giliberto, 1990; Pagliari et al., 2005; Hoesli and Oikarinen, 2012). REITs provide investors with opportunity to invest in diversified property portfolios through the purchase of individual REIT shares. The business model consists of buying properties, leasing and managing buildings, collecting rents from tenants and distributing net rents to shareholders (Geltner et al., 2001). A company must satisfy a number of requirements (operational, dividend distribution, and compliance) to qualify as a REIT. The main principle of this status is that REITs are exempted from corporate tax if they distribute most of the income in the form of dividends (e.g., 90% in the US; 95% in France).

Between 1995 and 2017, the market capitalisation of the European listed real estate sector multiplied by 10-fold, whereas the REIT Global Property Research

index exhibited a performance of 700%. This take-off coincided with the implementation of REIT regimes in some countries and the anticipation of their introduction in others. The Netherlands was the first country in Europe to adopt a REIT model in 1969 (Dutch REIT or FBI). Belgium introduced its regime in 1995 (SICAFI) and France in 2003 (SIIC). Then, the UK (UK-REIT), Germany (G-REIT) and Italy (SIIQs) adopted a similar status from 2007, followed by Finland (FINNISH REIT) and Spain (SOCIMI). This take-off also coincided with the financialisation of the global economy (Shiller, 2005; Stiglitz, 2010). The new statuses turned the listed real estate sector into a more attractive investment because of the tax transparency and the reinforcement of its liquidity. The inclusion of REITs in Standard and Poor's general market indices also contributed to changing financial investors' perceptions of the listed urban sector (Ambrose et al., 2007b). It gave publicly traded property companies the opportunity to rely more heavily on capital markets to finance their new investment strategies.

2.2.2 Beta of the real estate investment trust sector

Studies on the relationship between the REIT sector and market portfolios are numerous in the financial literature. Peterson and Hsieh (1997) establish that this link with the stock market is significant; however, it might vary across the sub-segments. Niskanen and Falkenbach (2010), for instance, emphasise the reinforced correlation of the European REITs with small cap and value stocks. It might also vary according to the level of liquidity and the information available to investors (Khoo et al., 1993), or the inclusion in a general market index of some emblematic REITs (Ambrose et al., 2007b). The role of institutional investors has also drawn attention. Chan et al. (2005) argue that the change in REIT structure and the increase in institutional participation have made US REIT stocks behave more like other stocks in the 1990s, especially the large cap REITs (Clayton and MacKinnon, 2003, 2001).

Many studies have investigated the dynamic character of the link. Morri and Romito (2017) provide support for the idea that REIT betas are time-varying in the USA, UK and France, whereas they are quite stable in Asian markets. For

the USA, Case et al. (2012) identify three periods when REITs were correlated with the stock market. They were high and without trend until August 1991. During the second period, from 1991 to 2001, correlations declined. As for the third period, starting in 2001, correlations increased steadily (Lee and Chiang, 2010). Sing et al. (2016) confirm these elements. They find a decrease for the US REITs betas in the pre-2000 period, and since 2003, a sharp increase, with a peak in 2009. Likewise, in an analysis of 16 countries, Hoesli and Moreno (2006) indicate that securitised real estate betas are generally found to have decreased in 1990–2004 (second period). Van Nieuwerburgh (2019b) explains that the subsequent beta increase (third period) was because of a higher correlation between US REITs and common stocks, as well as a higher increase in the REITs volatility.

Our work notably differs from these studies because we do not focus on the relationship between the entire REIT sector and the stock market. The scope of our analysis is the individual level and we adopt an intra-sectorial view. Furthermore, in this article, we consider REITs and quasi-REITs.¹ We also control for the adoption of an official REIT status. Thereafter, we use LPCs in reference to this set.

2.2.3 Metropoles, metropolisation and globalisation of the real estate markets

Metropolisation is a key transformation of contemporary European territories that has occurred since the 1980s. On a long run, the European urban system has been inherited from a proto-urban network that emerged during the Middle Ages and consolidated during the Renaissance (Bretagnolle et al., 2000). Its structure has remained quite unchanged during the modern era, and although a few new specialised cities appeared with the Industrial Revolution (Rozenblat and Pumain, 2018), they did not really modify the system as a whole. However, since the end of World War II, this system has undergone three main changes. For 40 years, the communist bloc reshaped the eastern part of the system before collapsing in the

1. Quasi-REITs are similar to REITs, except that a quasi-REIT can reinvest its earnings into the business rather than solely distributing them to stockholders the way REITs do. REITs and quasi-REITs are listed companies that derive their operational revenues from investment activities or a combination of investment and development activities.

1990s. Then, European integration has influenced the urban system, first in the West, and more recently in the East, unifying national urban hierarchies into an integrated macroregional urban structure. At last, globalisation has restructured the entire system, connecting all cities to the global scale.

In relation to the two last changes, the major long-distance networks' functions and the intermediation functions that together articulate local, national, continental and global scales were supposed to lead to the formation of new urban entities, called metropolises (Friedmann, 1986; Sassen, 1991; Taylor, 2004; Reitel, 2012). Through specialisation of some cities and selective concentration of rare and strategic globalised functions, this evolution would reinforce the hierarchical structure among European cities (Bretagnolle et al., 2000; Taylor and Derudder, 2016; Rozenblat and Pumain, 2018).

The notion of metropolisation may foster ambiguity about its meaning; that is, concentration of globalised functions in cities (Sassen, 1991), accumulation of wealth in urban regions (Reitel, 2012), over-productivity of big cities compared to medium and small cities and non-urbanised spaces (Halbert, 2010), reshaping of the urban hierarchy (Taylor and Derudder, 2016) or reinforcing the role of the metropolises in the national productive systems (Veltz, 2014). However, in spite of the blurriness of its definition, it seems easier to identify the process (metropolisation) than the space (metropolises): metropolisation reinforces global trends and worldwide economic factors in the structure of cities and transforms the connection of these cities to their local territories.

The building stocks, which have changed deeply over the past two decades, especially in financial centres and urban cores of the large metropolises (Kooijman, 2000; Lizieri, 2012), strongly mirrored this evolution. Globalising factors and changes in the business environment have affected the supply of and demand for office space (Lizieri, 2003), as well as subsequent corporate real estate strategies (Too et al., 2010). Supported by innovative technological processes (Sassen, 2015; Baum, 2017), the building stocks have reflected a heterogeneous orientation to-

wards the knowledge economy (Krätke, 2007). These trends modified traditional urban economies and reorganised urban hierarchies, within and between countries, as underlined by Potlogea (2018).

Our main objective in this article is to examine the relationship between financialisation and metropolisation through the LPC lens. As key actors in these changes and because of information availability at the financial and urban levels, they provide a good opportunity to study this link. We hypothesise that European LPCs are a transmitting channel between the financial evolution of the stock markets and metropolisation dynamics through the arbitrage of their investments' spatial allocations. In Europe, roughly one-third of the capital of a representative financialised LPC is owned by institutional investors. Therefore, financialised LPCs tend to adopt geographical allocation strategies, for external financing motivation, that are aligned with institutional investors' location preferences. Van Loon and Aalbers (2017) describe institutional investors' real estate investment strategies as "financialised strategies" in which real estate is perceived as a financial asset. As has been recently reported in the literature, institutional investors, looking for higher returns, directly or indirectly invest in properties situated in select locations (Halbert et al., 2014b; Lizieri and Pain, 2014; Zhu and Lizieri, 2020). In this sense, financialised LPCs would contribute to the acceleration of the metropolisation process encountered during the past two decades in Europe.

2.3 Methodology and data

Our goal is to explore the hypothesis that the most financialised LPCs are also more involved in the metropolisation process through their portfolio arbitrages. Critical to this assumption is the definition of a company's degree of financialisation. In this work, we follow the financial theory and use the CAPM and the beta estimate. This section details the methodologies used and presents the data set and the nomenclature of spatial units.

2.3.1 Beta increase as proxy for financialisation

The establishment of the CAPM paradigm began with Markowitz (1952), who demonstrated, following Von Neumann and Morgenstern (1942), that investors face two arguments in their portfolio choices: the asset return (the gain) and level of endured risk for this level of return. An investor's objective is to maximize the utility (or level of welfare), which is positively related to return and negatively related to risk. Tobin (1958) reported that the investment decision could be decomposed into two phases (two-fund separation theorem):

1. allocation of the wealth between a portfolio of risky assets and a single risk-free asset; and
2. choice of a unique combination of risky assets.

On these bases, Sharpe (1964) developed the CAPM that established the theoretical foundations of modern financial economics in a stochastic environment.

The CAPM is a market equilibrium model that evaluates the price of risk. In this approach, the risk for a financial asset has idiosyncratic and systematic dimensions. The idiosyncratic risk stands as the specific risk (endogenous risk) for a firm, whereas the systematic risk is the market risk (exogenous risk). Through diversification, the idiosyncratic risk can be avoided, and only the systematic market risk is profitable and thus should be priced. The basic CAPM indicates that the expected return of an asset, $E[R_i]$, is the sum of the risk-free rate, R_f , and the market risk premium ($E[R_m] - R_f$), multiplied by the beta of the asset, as shown in Equation 2.1. The beta is defined as the covariance of returns for the asset and the returns of the market portfolio, divided by the variance of the returns of the market portfolio.

$$E[R_i] = R_f + \beta_i * (E[R_m] - r_f) \quad (2.1)$$

For a financial asset, only its participation in the market risk is priced, and its participation is measured by its beta. When the beta is near 1, the asset moves in line with the financial market; when the beta is near zero, the asset is uncorrelated to the market. We will interpret a beta increase from 0 to 1 as the occurrence of

financialisation. For instance, if the beta evolves from 0.2 to 0.6, then the stock price dynamics become more correlated to the market index, and the company can be seen as more integrated to the financial market.

2.3.2 Measuring the jump in betas across listed property companies in Europe

For each company in the sample, we compute its time-varying beta by estimating a CAPM through an OLS regression, with robust standard errors² and a one-year rolling window.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \epsilon_{it} \quad (2.2)$$

In Equation 2.2, R_i is the daily total return for each firm, from January 2000 to August 2017. R_{ft} and R_{mt} are the contemporaneous risk-free rate and the daily total return of the European market, collected from Kenneth R. French's website. ϵ_{it} is the idiosyncratic term.

When a company's beta is close to zero, it means the company and the market do not covary; the level of financialisation is low. On the contrary, when its beta increases and tends towards 1, the level of financialisation increases, and its stock price dynamics tend to covary with the market dynamics. In our sample, the betas are close to zero at the beginning of the period for almost all the companies. Then, in numerous cases, we observe an increase in their betas, which stay high in the subsequent years (between 0.6 and 1). However, this phenomenon is not systematic; a significant part of the sample maintains a beta close to zero during the full period.

To better qualify the increase and segmentation, we implement Bai and Perron (2003) test for the beta series, with one possible unknown break date. The test detects whether a significant change occurs in the beta dynamic and provides the potential date of the change. It stands out that 67% of the significant break dates are clustered between 2003 and 2006. In the same time frame, no significant jump

2. The White (1980) matrix is used to correct for autocorrelations.

is observed for 12 firms in our sample. Then we use an adaptation of Henriksen and Merton (1981) and Howe and Jain (2004).³ More precisely, we jointly estimate a CAPM for the two periods with Equation 2.3.

$$R_{it} - R_{ft} = \alpha_i + \beta_{0i}D_t + \beta_{1i}(R_{mt} - R_{ft}) + \beta_{2i}[D_t * (R_{mt} - R_{ft})] + \epsilon_{it} \quad (2.3)$$

D_t is a temporal dummy variable equal to 1 before January 2005. The beta increase is measured by β_{2i} and should be significant at 5%.

Based on the results of the above methodology, two sub-groups will be defined. The first corresponds to the LPCs with a structural break date and with a sufficient and significant beta increase (at least 0.3) during the periods before and after January 2005. The second gathers the LPCs with no random break date or those with a limited or non-significant beta increase. We interpret a beta increase as a reinforcement of the company's degree of financialisation. Consequently, we call the former LPC group "financialised" and the latter "non-financialised".

2.3.3 Informativeness index

Financial theory traditionally emphasizes the quality of information available to the investors as a crucial factor. If our split between financialised LPCs (F-LPCs) and nonfinancialised (NF-LPCs), based on a beta jump, is relevant, then we should observe significant informativeness differences between both groups. A financialised company should be more informative.

Following Roll (1988), informativeness (or price informativeness) can be defined as the process of disclosure and integration of specific information in the stock price.⁴ To measure informativeness, we retain seven variables documented by the financial literature as having an important effect on the information level: the percentage of shares held by shareholders classified as institutional investors. Hartzell et al. (2006) state that institutional investors serve as a monitor in mitigating

3. These models are used to analyze market timing.

4. The concept of informativeness was initially developed to assess market efficiency and is also useful in a microstructure perspective.

the agency problem between shareholders and managers, and thus contribute to better information; the percentage of insiders' closely held shares. Insiders and blockholders might attempt to follow private objectives such as empire-building or maintaining control. The concentration of insider holdings as a proxy for information asymmetry is used, for instance, by Chiang and Venkatesh (1988); firm size, proxied by the market value of the firm. Larger companies are followed more closely in the market and have more sources from which information can leak into the market (An et al., 2012); the number of financial analysts following a firm, which is negatively correlated with information asymmetry (chiang1988insider,an2012information); forecast earnings error and forecast earnings dispersion among financial analysts. Companies facing higher information asymmetry have larger forecast errors and more dispersed forecasts (Devos et al., 2007; Chatterjee and Yan, 2008); the bid-ask spread. This measure is used as a proxy for information asymmetry by Anderson et al. (2009).

To test the index's explanatory power, we use a logit model, controlling for other classical financial determinants. We explain a dummy variable equal to 1 for F-LPCs, and 0 otherwise. In addition to the informativeness index, we control for the liquidity of the stock using the Amihud ratio (Amihud, 2002), for the size of the company with its capitalisation and for its financial leverage. The market-to-book ratio is used to control for the firm's investment profile (growth or value), and a dummy variable is used to control for the REIT status when it exists.

2.3.4 System-Generalised Method of Moments panel data estimation

Beyond the distinction in two groups (F-LPCs and NF-LPCs), the aim of the study is to evaluate if it is possible to establish continuous relations between financialisation (beta increase) and metropolisation (arbitrage towards upper urban segments). To provide elements about this issue, we use a System-Generalised Method of Moments (GMM) panel data estimation, outlined by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998). This methodology allows us to avoid issues concerning potential correlation between a regressor

and the error term. In addition, the advantage of System-GMM is its suitability for correcting potential endogeneity, unobserved firm-specific effects, omitted variable bias and measurement error (Bond et al., 2001). We made four System-GMM panel data estimations where the independent variables are the yearly log betas for each firm, between 2000 and 2017. The control variables are the equity value (capitalisation), Amihud ratio for liquidity, the financial leverage and the market-to-book ratio. The logarithm of the number of buildings held by the company is introduced to control for diversification, and a REIT dummy is also used. The variable of interest is the percentage of buildings owned by a company in a given urban segment (from large metropolises to small urban areas). A System-GMM panel model is estimated for each segment.

2.3.5 Data and urban areas

Our sample is composed of 99 listed real estate companies (REITs and quasi-REITs), in ten European countries, from 2000 to 2017.⁵ We collect data for 14,459 properties owned by the companies on an annual basis. For each building in each company's portfolio, we obtain its location using the SNL Real Estate database. Because 93% of properties are located in the same countries in which the companies are headquartered, the geographic analysis is restricted to these ten countries. Table B1 describes the variables and the data we use in our article. To document how the companies spatially reallocated their portfolios during that period, we work with the morphological urban areas (MUAs) and functional urban areas (FUAs), as defined by the EPSON Database Portal. The delineation of MUA is based on the selection of municipalities whose population density is greater than 650 inhabitants/ km^2 . A MUA is composed of high-density municipalities and municipalities that do not reach the threshold but are enclosed by other high-density municipalities. FUAs are based on the analysis of commuting patterns towards morphological urban cores. The urban cores correspond to all the MUAs over 20,000 inhabitants. The exterior ring of a FUA is constructed by selecting the municipalities in which more than 10% of the economically active population works in a MUA. Each FUA is structured around one MUA, except in a few

5. We retained firms with a listing period within the January 2002 to January 2010 interval because the structural divide documented afterwards is centred on 2006.

cases (e.g. if two MUAs send each other important commuting flows, they are aggregated into the same FUA).

We use Quantum Geographic Information System (QGIS) software to identify property locations. If a property is located within a FUA and a MUA, we included it in the urban core. If a property is located within a FUA but outside a MUA, we included it in the hinterlands. In other cases, we located the asset in a non-urban area. Following the OECD classification, we then organise FUAs into four categories: small urban area (population between 20,000 and 200,000), medium-sized urban area (200,000–500,000), metropolitan area (500,000–1.5 million) and large metropolitan area (population above 1.5 million). If metropolisation and urban sizes are not equivalent (Stratmann, 2011) among European countries, then we can reasonably consider urban areas above 500,000 to be metropolises or at least to have metropolitan attributes.⁶

2.4 Empirical results

In this section, we analyse the financialisation phenomenon by adopting a two-dimensional approach. Results are reported at the spatial and firm levels. First, we describe how companies differentially reallocate their portfolios across spaces, according to their degree of financialisation. Then, we report results on the causality between financialisation and metropolisation. Finally, we present a robustness check of results based on the firms' financial characteristics instead of the firm's beta as a measure of financialisation.

2.4.1 Space-level analysis: listed property companies' participation in the metropolisation process

Financialised and non-financialised listed property companies

Based on the results of the methodology detailed in Section 2.3.2, two subgroups are defined. The first (financialised LPCs) corresponds to the LPCs with a structural break date and with a sufficient and significant beta increase (at least 0.3) during the periods before and after January 2005. The second (non-

6. Smaller cities might also sometimes present metropolitan features (e.g. Nokia in Sweden or Antwerp in Belgium).

financialised LPCs) gathers the LPCs with no random break date or those with a limited or non-significant beta increase. Among the 99 companies, 87 exhibit a structural break, whereas 12 do not. Of the 87 companies, 58 report a statistically significant β_{2i} greater than 0.3. The first group includes 58 companies and the second comprises 41.⁷

The difference in the beta profile is important between the two groups. For the entire sample, the average beta increases from 0.125 before January 2005 to 0.489 thereafter. For the financialised group, it evolves from 0.143 to 0.694, whereas for the non-financialised group, it increases from 0.101 to 0.201. However, it should be noted that even if we qualify these two groups as “financialised” and “non-financialised”, for ease of analysis, the whole set is in fact a continuum.

General evolution of the spatial allocation

For each country, we consider two groups of buildings: those owned by the F-LPCs and those owned by the NF-LPCs. In six countries (Belgium, France, Germany, Sweden, Switzerland and the UK), the number of assets owned by both types is enough to make all the required comparisons. In four countries (Finland, Italy, The Netherlands and Spain), the assets owned by the NF-LPCs are too limited to make intra-country comparisons (Table 2.1).

Between 2002 and 2016, the assets owned by the F-LPCs at the aggregated level decreased by 18% (from 5,494 to 4,496). The asset reduction strategies were strong in the UK (-32%) and The Netherlands (-26%), which are traditionally considered as the most “advanced” in real estate financialisation. On the contrary, assets owned by the NF-LPCs increased by 9% (from 2,357 to 2,578). The trend was particularly clear in Germany (+43%) and Switzerland (+49%). Given the profile of these two countries, we can analyse it as a flight to quality.

Two countries deserve special attention. Assets owned in Switzerland actually tend to increase by 63% when they are owned by the F-LPCs and NF-LPCs. As

7. Of the 58 companies from the first group, 33 and of the 41 companies from the second group, 20 have REIT status.

for Spain, the situation is characterised by almost no non-financialised companies owning assets and simultaneously a very important disinvestment (-56%) of the financialised ones. When Spain was hit by strong economic turmoil after 2008, the financialised companies logically reduced their expositions, but at the same time, the absence of the non-financialised LPCs did not cushion the difficulties. Spain could illustrate the undesirable consequences that can occur when the real estate sector is driven by the financial markets.

Core, hinterlands and non-urban: which financial arbitrages?

As shown in Table 2.1, core spaces are, of course, the privileged space for investing, whatever the type of company. However, if approximately 90% of the assets are located in this area for the financialised companies, this percentage is 10% lower for the non-financialised.

At first sight, during the studied period and for the whole set, the F-LPCs (+2.01%) tend to disinvest non-urban spaces in favour of core spaces, but NF-LPCs (+1.64%) tend to favour hinterlands. For the German and Swedish F-LPCs, this move in the direction of the core is very strong. However, the Belgian F-LPCs have evolved in the opposite direction. It is also important to mention that when the numerous Swedish assets are removed from the global set, this reallocation trend (non-urban to core) becomes unclear at the sample level.

For the NF-LPCs, the detailed analysis had to be restricted to six countries⁸ where the assets were sufficient in number. At the country level, it appears that the average trend (non-urban → hinterlands) is also unclear. Regional evolutions are actually heterogeneous: from non-urban spaces towards core spaces for Sweden and the UK and from core towards non-urban and/or hinterlands for France and Switzerland. Consequently, the idea of a flight from non-urban spaces towards core (F-LPCs) or hinterlands (NF-LPCs) should not be overestimated; several national cases differ or even exhibit opposite trends.

Looking at the relative evolutions (variation of the variations, lower part of Table 2.1) offers clearer insights. Compared to the NF-LPCs, the allocation profiles of

8. Belgium, France, Germany, Sweden, Switzerland, and the UK.

the F-LPCs shift more towards core and less hinterlands. The trend is particularly strong for France, Germany and Switzerland. It is less clear for Sweden and the UK, whereas the Belgium evolution goes in the other direction. The result suggests that, contrary to the non-financialised companies, the financialised firms might actively participate in the metropolisation process and the reorientation towards the knowledge economy, as identified by Krätke (2007). It also suggests that the F-LPCs better anticipate the shrinking cities process in Germany by recentralising their investments in the urban cores.

Table 2.1 – Variations of the spatial allocations for the F-LPCs and the NF-LPCs

F-LPC	Country	Total assets in 2002		Total assets in 2016		Variation		Spatial allocation in 2002			Spatial allocation in 2016			Allocation variations 2002-2016			
		Non urban	Hinterlands	Core	Non urban	Hinterlands	Core	Non urban	Hinterlands	Core	Non urban	Hinterlands	Core	Non urban	Hinterlands	Core	
F-LPC	Belgium	381	409	7.35%	14	43	324	28	70	311	311	5.83%	3.17%	5.83%	-9.00%		
	France	1008	820	-18.65%	16	59	933	16	48	756	756	0.00%	0.36%	0.00%	-0.36%		
	Germany	127	115	-9.45%	7	13	107	3	4	108	108	-6.76%	-2.90%	-6.76%	9.66%		
	Sweden	1288	1088	-15.53%	103	92	1093	9	56	1023	1023	-7.17%	-7.17%	-2.00%	9.17%		
	Switzerland	104	170	63.46%	1	2	101	1	1	168	168	-0.37%	-0.37%	-1.33%	1.71%		
	United Kingdom	1287	865	-32.79%	50	88	1149	26	54	785	785	-0.88%	-0.88%	-0.59%	1.47%		
	Finland	222	220	-0.90%	7	14	201	2	11	207	207	-2.24%	-2.24%	-1.31%	3.55%		
	Italy	212	225	6.13%	8	35	169	5	41	179	179	-1.55%	-1.55%	1.71%	-0.16%		
	Netherlands	681	503	-26.14%	77	43	561	55	33	415	415	-0.37%	-0.37%	0.25%	0.13%		
	Spain	184	81	-55.98%	2	6	176	2	1	78	78	1.38%	1.38%	-2.03%	0.64%		
	Total	5494	4496	-18.17%	285	395	4814	147	319	4030	4030	-1.92%	-1.92%	-0.09%	2.01%		
	NF-LPC	Country	Total assets in 2002		Total assets in 2016		Variation		Spatial allocation in 2002			Spatial allocation in 2016			Allocation variations 2002-2016		
		Belgium	336	325	-3.27%	40	70	226	38	70	217	217	0.71%	-0.21%	0.71%	-0.49%	
France		991	1030	3.94%	13	70	908	25	105	900	900	1.12%	1.12%	3.13%	-4.25%		
Germany		105	150	42.86%	5	3	97	7	6	137	137	-0.10%	-0.10%	1.14%	-1.05%		
Sweden		413	432	4.60%	149	39	225	113	42	277	277	-9.92%	-9.92%	0.28%	9.64%		
Switzerland		164	245	49.39%	8	10	146	10	23	212	212	-0.80%	-0.80%	3.29%	-2.49%		
United Kingdom		300	340	13.33%	43	58	199	40	66	234	234	-2.57%	-2.57%	0.08%	2.49%		
Finland		5	8	60.00%	0	1	4	2	3	3	3	25.00%	25.00%	17.50%	-42.50%		
Italy		16	12	-25.00%	1	0	15	1	0	11	11	2.08%	2.08%	0.00%	-2.08%		
Netherlands		22	2	-90.91%	0	1	21	0	0	2	2	0.00%	0.00%	-4.55%	4.55%		
Spain		5	34	580.00%	1	0	4	5	3	26	26	-5.29%	-5.29%	8.82%	-3.53%		
Total		2357	2578	9.38%	260	252	1845	241	318	2019	2019	-1.68%	-1.68%	1.64%	0.04%		
														Variation of the variations			
														Country	Core		
														Belgium	-5.12%		
														France	3.13%		
														Germany	-10.71%		
														Sweden	2.27%		
														Switzerland	4.63%		
														United Kingdom	1.02%		
														Total	1.74%		
														Core	-1.97%		

Urban size: which financial arbitrages?

On average, LPCs roughly allocate 50% of their buildings in large metropolitan areas, 25% in metropolitan areas, 13% in medium-sized urban areas and 12% in small urban areas (Table 2.2).

At first sight, between 2002 and 2016 and for the whole set, the F-LPCs allocation appears approximately unchanged. On the other hand, the NF-LPCs tend to disinvest in the large metropolitan areas (-6.29%) in favour of the other segments. The apparent stability of the F-LPC allocation, however, dissimulates a trend because of the great number of Swedish assets. A portfolio reorientation towards large metropolises (populations greater than 1.5 million) is clearly observable in several countries (Germany, Switzerland, the UK, Italy and Spain), and towards metropolitan areas between 500,000 and 1.5 million people for France. Belgium and Sweden are actually exceptions to this trend, with a disinvestment of the large metropolises by the F-LPCs. In the first case, it benefits all the other Belgian segments, which might be explained by a preference for regional investments in Wallonia and Flanders, compared to Brussels, in a context of increasing regionalism. In the second case, the small and medium-sized urban areas take advantage of this contrarian evolution. The location of telecommunication clusters in small Swedish cities, as exemplified by Nokia (33,000 inhabitants), is a possible explanation.

Regarding the country-level NF-LPC evolutions, the average disinvesting trend in the large metropolises is relevant for the different countries. This allocation shift is particularly clear for Germany, France and Switzerland. For Belgium and the UK, the trend exhibits a reduced magnitude. For Sweden, the flight is simultaneous to a flight from the medium and small metropolises in favour of the metropolitan areas. The analysis in difference of differences for the six countries with enough assets makes the result clearer. Between 2002 and 2016, in relative terms, the financialised LPCs reallocated their portfolios towards the large metropolises, in particular in Germany, France and Switzerland. Contemporaneously, the non-financialised LPCs shifted their portfolios towards the other segments (exclusively

the metropolises for Sweden). Belgium is an exception, with a reversed evolution.

Table 2.2 – Variations of the metropolitan allocations for the F-LPCs and the NF-LPCs

F-LPC	Country	Total assets in 2002		Total assets in 2016		Metropolitan allocation in 2002						Metropolitan allocation in 2016						Allocation variations 2002-2016															
		367	992	881	804	112	69	31	6	14	24	94	109	117	109	118	35	27	LMA	MA	MSUA	SUA	LMA	MA	MSUA	SUA							
F-LPC	Belgium	120	1185	1079	365	489	58	273	6	70	26	9	7	5.00%	-2.62%	-3.63%	1.25%	-1.28%	4.37%	-2.01%	-1.09%	-1.28%	4.37%	-2.01%	-1.09%	-1.28%	4.37%	-2.01%	-1.09%				
	Germany	103	1237	839	864	162	125	8	86	17	34	30	13	2.98%	-4.15%	1.25%	-0.07%	-2.98%	4.15%	-1.25%	0.07%	-2.98%	4.15%	-1.25%	0.07%	-2.98%	4.15%	-1.25%	0.07%				
	Switzerland	215	604	220	111	23	18	0	23	29	0	157	43	18	0.00%	-3.80%	6.24%	-2.44%	0.00%	-3.80%	6.24%	-2.44%	0.00%	-3.80%	6.24%	-2.44%	0.00%	-3.80%	6.24%	-2.44%			
	Finland	204	448	448	0	278	20	20	84	242	18	52	21	48	0.00%	0.72%	-3.32%	-3.67%	0.00%	0.72%	-3.32%	-3.67%	0.00%	0.72%	-3.32%	-3.67%	0.00%	0.72%	-3.32%	-3.67%			
	Italy	182	79	79	103	23	36	20	20	242	36	5	8	3	23.15%	-6.31%	-9.65%	-7.19%	23.15%	-6.31%	-9.65%	-7.19%	23.15%	-6.31%	-9.65%	-7.19%	23.15%	-6.31%	-9.65%	-7.19%			
	Netherlands	5209	4349	4349	2497	1420	657	655	2043	657	1228	518	550	5	0.96%	-1.21%	-0.70%	0.46%	0.96%	-1.21%	-0.70%	0.46%	0.96%	-1.21%	-0.70%	0.46%	0.96%	-1.21%	-0.70%	0.46%			
	NF-LPC	Country	Total assets in 2002		Total assets in 2016		Metropolitan allocation in 2002						Metropolitan allocation in 2016						Allocation variations 2002-2016														
		Belgium	296	978	287	95	116	51	84	86	51	113	55	32	87	113	55	32	1.93%	0.18%	1.93%	0.18%	-1.78%	0.18%	1.93%	0.18%	-1.78%	0.18%	1.93%	0.18%			
		France	100	143	1005	640	123	20	4	4	20	29	29	10	563	170	156	116	-9.42%	3.73%	2.95%	2.75%	-9.42%	3.73%	2.95%	2.75%	-9.42%	3.73%	2.95%	2.75%			
		Germany	264	319	264	62	81	31	90	90	31	131	34	96	52	52	29	10	-10.64%	7.36%	0.28%	2.99%	-10.64%	7.36%	0.28%	2.99%	-10.64%	7.36%	0.28%	2.99%			
		Switzerland	156	235	101	235	19	21	15	15	21	47	37	28	123	47	37	28	-12.40%	7.82%	2.28%	2.30%	-12.40%	7.82%	2.28%	2.30%	-12.40%	7.82%	2.28%	2.30%			
		United Kingdom	257	300	300	161	32	35	29	29	35	40	41	33	186	40	41	33	-0.65%	0.88%	0.05%	0.28%	-0.65%	0.88%	0.05%	0.28%	-0.65%	0.88%	0.05%	0.28%			
		Finland	5	6	6	0	3	0	2	2	0	2	1	3	0	2	1	3	0.00%	-26.67%	16.67%	10.00%	0.00%	-26.67%	16.67%	10.00%	0.00%	-26.67%	16.67%	10.00%	0.00%		
		Italy	15	22	22	11	1	10	4	4	10	1	0	0	10	1	0	0	24.24%	2.42%	0.00%	-26.67%	24.24%	2.42%	0.00%	-26.67%	24.24%	2.42%	0.00%	-26.67%	24.24%	2.42%	0.00%
Netherlands		4	29	29	2	0	17	4	4	17	2	0	0	20	2	0	0	18.97%	6.90%	-14.66%	-11.21%	18.97%	6.90%	-14.66%	-11.21%	18.97%	6.90%	-14.66%	-11.21%	18.97%	6.90%	-14.66%	-11.21%
Spain		2097	2337	2337	1118	427	286	266	1099	286	560	356	322	1099	560	356	322	-6.29%	3.60%	1.59%	1.09%	-6.29%	3.60%	1.59%	1.09%	-6.29%	3.60%	1.59%	1.09%				
Total		Country	Total assets in 2002		Total assets in 2016		Metropolitan allocation in 2002						Metropolitan allocation in 2016						Allocation variations 2002-2016														
		Belgium	5.68%	-0.71%	-3.88%	3.84%	5.68%	-0.71%	-3.88%	3.84%	5.68%	-0.71%	-3.88%	3.84%	5.68%	-0.71%	-3.88%	3.84%	-8.14%	9.98%	3.91%	1.74%	-8.14%	9.98%	3.91%	1.74%	-8.14%	9.98%	3.91%	1.74%			
		France	-15.64%	9.98%	-6.91%	3.84%	-15.64%	9.98%	-6.91%	3.84%	-15.64%	9.98%	-6.91%	3.84%	-15.64%	9.98%	-6.91%	3.84%	-15.64%	9.98%	-6.91%	3.84%	-15.64%	9.98%	-6.91%	3.84%	-15.64%	9.98%	-6.91%	3.84%			
		Germany	-3.05%	11.89%	-1.94%	6.91%	-3.05%	11.89%	-1.94%	6.91%	-3.05%	11.89%	-1.94%	6.91%	-3.05%	11.89%	-1.94%	6.91%	-3.05%	11.89%	-1.94%	6.91%	-3.05%	11.89%	-1.94%	6.91%	-3.05%	11.89%	-1.94%	6.91%			
	Switzerland	-15.38%	11.97%	1.04%	2.37%	-15.38%	11.97%	1.04%	2.37%	-15.38%	11.97%	1.04%	2.37%	-15.38%	11.97%	1.04%	2.37%	-15.38%	11.97%	1.04%	2.37%	-15.38%	11.97%	1.04%	2.37%	-15.38%	11.97%	1.04%	2.37%				
	United Kingdom	-4.22%	1.94%	1.33%	0.95%	-4.22%	1.94%	1.33%	0.95%	-4.22%	1.94%	1.33%	0.95%	-4.22%	1.94%	1.33%	0.95%	-4.22%	1.94%	1.33%	0.95%	-4.22%	1.94%	1.33%	0.95%	-4.22%	1.94%	1.33%	0.95%				
	Spain	-5.33%	2.39%	2.30%	0.64%	-5.33%	2.39%	2.30%	0.64%	-5.33%	2.39%	2.30%	0.64%	-5.33%	2.39%	2.30%	0.64%	-5.33%	2.39%	2.30%	0.64%	-5.33%	2.39%	2.30%	0.64%	-5.33%	2.39%	2.30%	0.64%				
	Total	Total assets in 2002		Total assets in 2016		Metropolitan allocation in 2002						Metropolitan allocation in 2016						Allocation variations 2002-2016															
	Country	Total assets in 2002		Total assets in 2016		Metropolitan allocation in 2002						Metropolitan allocation in 2016						Allocation variations 2002-2016															

Assets in non-urban areas are excluded in this table.

2.4.2 Firm-level analysis: informativeness, causality and robustness check

Informativeness index

Panel A in Table 2.3 reports the mean difference tests between FLPCs and NF-LPCs for the seven variables we use to create the informativeness index to check the validity of our measure of financialisation. All the means are significantly different, as expected. F-LPCs have greater institutional ownership, are less dominated by insiders and tend to be larger. More analysts tend to follow these firms, and their earnings forecasts are better and less dispersed. The bid-ask spread is smaller for the F-LPCs, as expected. To obtain a synthetic view, we aggregate these factors to create an informativeness index,⁹ ranging between 1 and 10. A higher index indicates a better information level. For the F-LPCs, the average index equals 6.48, with 46 companies above 5 and 12 below. However, for the NF-LPCs, the mean index equals 3.28, with just four companies above 5 and 37 below.

9. For each of the seven variables, companies are ranked into deciles from 1 (opacity) to 10 (transparency). The overall index is defined as the average of the company rankings, for all the variables

Table 2.3 – Comparison of the variables of the informativeness index and logistic estimation results

	F-LPC (Mean)	NF-LPC (Mean)	Difference in means	t-Statistics
Panel A				
Institutional ownership	0.31	0.16	0.15***	(3.63)
Closely held shares	0.27	0.62	-0.35***	(-6.78)
ln(Market value)	20.61	18.84	1.77***	(6.83)
Market value (in EUR, million)	1553.06	331.83	1221.23***	(4.39)
Number of analyst following	4.09	0.88	3.21***	(6.46)
Forecast error	0.42	0.68	-0.26**	(-2.27)
Forecast dispersion	0.35	0.86	-0.51***	(-7.42)
Bid-ask	0.01	0.03	-0.02***	(-3.64)
Informativeness index	6.48	3.28	3.19***	(8.65)
Observations	58	41	99	
Panel B				
Logit coefficient				
Informativeness index			0.692**	(2.35)
Amihud ratio			-9.296**	(-2.44)
Capitalisation			0.000931	(1.16)
Leverage			-0.524	(-1.45)
Market-to-book			0.355	(0.76)
REIT			-0.413	(-0.56)
Constant			-1.994	(-1.21)
Observations			99	

Panel A reports difference in means of variables used to create the informativeness index. Panel B presents the results of the logit model where the dependent variable is a dummy that takes 1 for financialised listed property companies, and 0 otherwise. t-Statistics are presented in parentheses. The superscripts ***, ** and * denote the significance at 1%, 5% and 10% level, respectively.

The logit model results are reported in Panel B in Table 2.3. The information index is clearly significant with respect to the group belonging and that liquidity is also significant. None of the other variables explain the segmentation. Thus, the profile of a financialised LPC exhibits a high level of information and good liquidity. The strategy of defining financialisation by a beta jump is corroborated by this multi-criteria analysis.

Does the beta measure reflect the urban hierarchy?

Table 2.4 reports the estimation results of the System-GMM panel models we use to analyse the relation between financial and urban hierarchies. The Arellano–Bond AR(2) p-values fail to reject, as required, the null hypothesis of no second-order serial correlation except for the second column where the p-value is 0.098 (we cannot reject the null hypothesis of no autocorrelation at the 10% significance level). The null hypothesis of the joint validity of all instruments cannot be rejected, as indicated by the p-values of the Hansen test statistic, which confirms the suitability of our instruments.

The results in Table 2.4 show that the level of liquidity for the stock and the number of assets affect the beta, whereas the leverage, the equity value, market-to-book ratio and the REIT status do not (except for the third column). The variables of interest are significant and exhibit an interesting structure. Owning assets in large metropolises is associated with higher betas. If the allocation in the large urban areas evolves from 20% to 40%, the beta of the company is heightened by 39%. On the other hand, buildings located in metropolises and in medium or small urban areas tend to decrease the beta. It is relevant to note that these coefficients exhibit a clear decreasing structure, suggesting that the financial hierarchy and the urban hierarchy are significantly related.

Table 2.4 – System-GMM panel estimation results

	Large Metropole	Metropole	Medium M	Small M
Lagged Betas	0.191*** (4.01)	0.238*** (4.62)	0.192*** (4.14)	0.221*** (4.18)
EquityValue	1.41e-11 (0.62)	1.58e-11 (0.89)	4.93e-11** (2.09)	1.51e-11 (0.96)
Amihud	-0.00137*** (-11.75)	-0.00122*** (-18.59)	-0.00129*** (-13.73)	-0.00129*** (-13.71)
LnAT	0.253*** (2.82)	0.109** (2.40)	0.190*** (3.06)	0.200** (2.32)
Leverage	-0.00742 (-0.36)	-0.00933 (-0.56)	-0.00975 (-0.51)	-0.0248 (-1.16)
MarketToBook	0.0631 (0.96)	0.0303 (0.73)	0.0194 (0.49)	0.0417 (1.26)
REITDummy	-0.290 (-1.48)	-0.0606 (-0.48)	-0.261* (-1.75)	-0.156 (-1.27)
LargeM	0.0193*** (2.71)			
M		-0.0289* (-1.81)		
MediumM			-0.0400*** (-3.32)	
SM				-0.0488** (-2.58)
Constant	-4.731*** (-3.71)	-2.142*** (-3.66)	-2.134*** (-3.95)	-2.399*** (-4.72)
Time dummy	Yes	Yes	Yes	Yes
Country dummy	Yes	Yes	Yes	Yes
Hansen (p-value)	0.185	0.357	0.390	0.609
AR(1)	0.000239	0.000665	0.000224	0.000373
AR(2)	0.304	0.0989	0.313	0.156

*This table reports the results of four System-GMM panel regressions. The variable of interest is the percentage of buildings owned by a company in a given urban segment (from large metropolises to small urban areas). A panel model is estimated for each segment and represented in a separate column. Independent variables are the yearly log betas for each firm, between 2000 and 2017. t-Statistics (reported in parentheses) are robust to heteroscedasticity and within-firm serial correlation. Windmeijer (2005) finite sample correction for standard errors is employed. The superscripts ***, ** and * denote the significance at 1%, 5% and 10% level, respectively.*

Robustness check: firms' financial characteristics as a measure of financialisation

As a robustness check, we use the firms' financial characteristics instead of the firms' beta as a measure of financialisation. In this new model, the endogenous variable is no longer the log of the yearly betas but the log of the yearly informativeness (or transparency) indices created using the aggregation of seven firms' financial characteristics reported in Table 2.3. We use the same control variables as those used in Section 2.4.2 with the exception of the Amihud ratio for liquidity and the equity value (market capitalization) because these two variables are used to create the informativeness (transparency) index (the dependent variable). The variable of interest is the percentage of buildings owned by a company in a given urban segment (from large metropolises to small urban areas). A panel model is estimated for each segment. The results of this alternative estimation specification, reported in Table 2.5, support the argument that owning assets in large metropolises is associated with higher levels of financialisation as proxied by the informativeness (transparency) index. On the other hand, buildings located in medium or small urban areas tend to decrease the financialisation level. As for the buildings located in metropolises, results are not significant. The results support our previous argument that financial and urban hierarchies are significantly related.

Table 2.5 – Firms’ financial characteristics as a measure of financialization

	Large Metropole	Metropole	Medium M	Small M
LnAT	0.193*** (4.89)	0.184*** (4.89)	0.187*** (5.22)	0.179*** (5.35)
Leverage	-0.0608*** (-4.64)	-0.0605*** (-4.19)	-0.0644*** (-4.64)	-0.0545*** (-4.48)
MarketToBook	0.0164 (0.78)	0.0134 (0.66)	0.0169 (0.80)	0.00218 (0.11)
REITDummy	0.385*** (3.58)	0.427*** (3.96)	0.415*** (4.07)	0.339*** (3.43)
LargeM	0.00456** (2.31)			
M		-0.00198 (-0.85)		
MediumM			-0.00899** (-2.03)	
SM				-0.0201*** (-5.82)
Constant	0.363 (1.05)	0.804*** (3.09)	0.835*** (3.12)	0.763*** (3.10)
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Firm clusters	Yes	Yes	Yes	Yes
Adjusted R-Square	0.396	0.364	0.386	0.454

*This table reports the results of four panel regressions. The variable of interest is the percentage of buildings owned by a company in a given urban segment (from large metropolises to small urban areas). A panel model is estimated for each segment and represented in a separate column. Independent variables are the yearly log informativeness (transparency) indices for each firm, between 2000 and 2017. T-Statistics are reported in parentheses. Standard Errors are clustered at the firm level. The superscripts ***, ** and * denote the significance at 1%, 5% and 10% level, respectively.*

2.5 Conclusion

In this article, we use a large sample of European LPCs to analyse whether a link exists between financialisation and metropolisation for European LPCs. We

observe a heterogeneous increase of their financial integration and document how these variations can be placed in relation to their participation in metropolisation dynamics through their strategic building arbitrages. We would argue that LPCs that engage a financialisation process obtain an advantage in their access to the capital markets (through facilitated stocks and bonds issuances) and thus they are increasingly able to achieve greater market power and increase their investment opportunities compared to non-financialised LPCs. Therefore, they become able to select real estate assets with higher returns and lower perceived risk. In parallel, financialised LPCs adopt geographical allocation strategies to reinforce their readability for institutional investors. Our results indicate that they tend to invest in urban cores of large metropolises, which are more easily identified by their investors and creditors, whereas non-financialised LPCs, with less market and financial power, acquire the rest.

We find that the number of assets owned by the financialised companies decreases, especially in the most advanced countries in the financialisation process (The Netherlands and the UK). These companies also tend to reallocate their buildings from non-urban spaces towards the urban core, as well as arbitrage small and medium urban areas in favour of metropolises and large metropolises. On the contrary, the strategy for the non-financialised companies consists of increasing the number of assets, especially in flight-to-quality countries such as Germany and Switzerland. Spatially, they also tend to reallocate non-urban spaces in favour of hinterlands and reallocate metropolises in favour of small and medium urban areas. Sweden and Belgium appear as exceptions because of the metropolitan features of some of their intermediate cities and regional preferences. The definition of financialisation is robust and corroborated by other financial criteria (especially the informativeness index). Finally, a parallel can be drawn between urban hierarchy and financial hierarchy.

It could be interesting for future research to document whether a transmitting channel between the financial and the urban evolutions can also be observed for other types of vehicles (e.g. real estate funds), which might sometimes represent

larger investments compared to the LPC sector (e.g. Germany).

Chapter 3

Macroeconomic risk factors and Chinese FDIs in real estate: Evidence from the Asia-Pacific public real estate markets

Abstract

The aim of this article is to analyze the role of Chinese foreign direct investments (FDIs) in the dynamics of real estate in the Asia-Pacific region after the global financial crisis. We use a linear asset pricing model including macroeconomic risk factors and develop a metric to measure FDIs in the real estate sector. Based on panel econometrics, our robust results report that Chinese FDIs significantly influence Asia-Pacific region's public real estate markets, shedding new light on the Chinese Belt and Road Initiative.

Keywords: Foreign direct investments; Real estate; Listed property companies; Chinese investment; Asia-Pacific region; Macroeconomic risks.

3.1 Introduction

While the Chinese economy has grown to become the second largest economy in the world over the last two decades, its role and positioning in the Asia-Pacific (APAC) region has evolved from that of a regional player to a major powerhouse (Zhang and Sun, 2008). Foreign direct investments (FDIs) have played a key role in China’s emergence among APAC economies (Davies, 2013). In contrast to Japanese FDIs overwhelmingly linked to manufacturing activities, Chinese FDIs in APAC countries have been dominated by investments in the real estate sector (Lim et al., 2019). From 2012 and 2017, FDIs related to real estate development hovered between 21% and 34% of all Chinese FDIs in the Association of South-east Asian Nations (ASEAN) economies (compared with an average of 3% for all Japanese FDIs and 17% from within ASEAN countries over the same period). Among the reasons evoked for explaining China’s high relative level of foreign direct investment in real estate (FDIRE) in the APAC region, attempts to build soft power through real estate markets have been pointed out (Büdenbender and Golubchikov, 2017). In effect, since July 1994, when China’s State Council decided to privatize public housing units (Wang, 2011), China has become a global property superpower with the real estate sector being identified as a “pillar industry of the national economy” (Davies, 2006; Wang, 2011; Aveline-Dubach, 2016). From 1995 to 2019, real estate investments increased from 5% to over 13% of China’s gross domestic product (GDP), 70% of which were devoted to residential real estate (Rogoff and Yang, 2020). In the decade since China became a World Trade Organization (WTO) member in December 2001, as the country urbanised at breakneck speed, Chinese property markets boomed (Glaeser et al., 2017), and developers’ profit margins kept increasing, eventually outperforming those of the manufacturing sector (Wu et al., 2020). In this context, high levels of competition among property developers resulting in dramatically increasing land auction prices coupled with the growing appetite of China’s middle class for overseas properties were strong incentives for Chinese developers to internationalize.

The APAC region became a major focus of Chinese developers’ activities. Large

residential projects aimed at mainland Chinese buyers (e.g., Country Garden's Forest City in Johor, Malaysia; Moser, 2018) were undertaken. Chinese property developers and buyers have thus become an integral part of many real estate markets in the APAC region.¹ An example of such a market is the Australian residential market, the intertwining of which with Chinese property developers and the question about its resilience in view of the high number of Chinese foreign buyers have been the focus of much past research (Wong et al., 2017; Ma et al., 2021).

Faced with the Chinese economy's rapid rise and concomitant internationalization, real estate researchers have been wondering how "Global China" impacts returns on real estate assets in APAC markets. Traditionally, the US real estate market, deemed the most developed market globally, has acted as a bellwether for APAC real estate markets. However, recent research shows that the US is no longer the only influential real estate market in the region while China is emerging as a major regional real estate volatility leader (Liow et al., 2019).

This paper aims to shed some light on the consequences of China's outward FDIRE for investors in APAC public real estate markets, across a sample of eight APAC countries (Australia, India, Indonesia, Japan, Malaysia, Philippines, Singapore, and Thailand). This issue is important not only regionally but also globally as the estimated value of the commercial real estate sector in the APAC has risen considerably in recent years, amounting to US\$10.2 trillion in 2020. Meanwhile, listed real estate's market capitalization in the APAC region was equal to US\$1.5 trillion as of 2020, which represents 42% of the global listed real estate markets (EPRA, 2021). Taken together, China, Japan, and Australia account for nearly 65% of the market in the region with a market capitalization of US\$974 billion (US\$361 billion, US\$250 billion, and US\$111 billion, respectively). For a comprehensive literature review on the potential of the Asian real estate markets, the reader is referred to Newell (2021).

1. These real estate development projects are different from, albeit parallel to, the massive infrastructure projects underpinning the implementation of China's Belt and Road Initiative in the region.

Our study is part of a rich literature on Chinese inward and outward FDIs since its Open Door Policy was enacted in 1978. Numerous studies have focused on explaining the determinants of China's FDIs (Buckley et al., 2007; Ramasamy et al., 2012; Blomkvist and Drogendijk, 2013), while others have examined the consequences of China's FDIs on the countries of destination (Gholipour et al., 2014; Wong et al., 2014; Li et al., 2020; Gawellek et al., 2021). The impact of foreign capital inflows on asset prices, and especially real estate prices in the country of destination, also has been investigated in the literature. Calvo et al. (1996) argue that an increase in capital inflows to a certain country would be associated with higher equity and real estate prices. Lieser and Groh (2014) report that FDIs enhance local economic activity and produce significant real estate demand in local markets. Bo and Bo (2007) examine the relationship between housing prices and international capital inflows in China and show that foreign capital helps boost the rise in housing prices. Kim and Yang (2011a) claim that capital inflows in an array of emerging Asian economies (South Korea, Malaysia, Indonesia, Philippines, and Thailand) contributed to asset price appreciation in this region during the period 1999-2006. By the same token, using data from 21 emerging economies (among these countries are Malaysia, Philippines, Thailand, and China), Gholipour (2013) finds that foreign real estate investment contributed to house price increases over the period 2000-2008. Chow and Xie (2016) demonstrate that, over the period 2000-2014, a surge in FDIRE was positively associated with the growth rate of house prices in Singapore.

Following the global financial crisis and the concomitant rise of Asian economies spurred by the emergence of China as an economic superpower and after a decade of massive investments in real estate markets globally, the Chinese government has put a halt to capital outflows by individual citizens in view of real estate investment outside of the mainland. Meanwhile, Chinese real estate players (developers, institutional investors) are increasingly active in the APAC markets. In this study, we focus on the impact of China-Hong Kong outward FDIRE in the APAC region by taking the public real estate sector as a natural experiment. We consider Real

Estate Investment Trusts (REITs) and quasi-REITs. A REIT is a listed company that owns and manages many types of income-producing commercial properties. REITs' business model consists of buying properties, leasing and managing buildings, collecting rent from tenants, and distributing most of the income in the form of dividends to shareholders as a pass-through entity. The REIT model, which originated in the USA in 1960, has been very successful in the APAC. Quasi-REITs are similar to REITs, except that a quasi-REIT can reinvest its earnings into the business rather than solely distributing them to stockholders the way REITs do. In that sense, REITs and quasi-REITs are listed companies that derive their operational revenues from investment activities or a combination of investment and development activities. Hereinafter, we use Listed Property Companies (LPCs) in reference to this set. LPCs represent an indirect way of investing in commercial real estate. Therefore, we investigate the impact of China-Hong Kong outward FDIRE on commercial real estate in the APAC region, using public real estate equities as a transmitting channel. To our knowledge, we are among the firsts to analyze this channel to shed new light on Chinese FDIs in the APAC region. The relevance of this paper lies in analyzing the systemic risk posed by China to the real estate sector in APAC economies.

Based on a new linear asset pricing model, our results show that Chinese FDIRE significantly impact LPCs' returns in the selected countries over the period 2007-2017. In contrast to the two G7 economies that are influential in the region under consideration (i.e., Japan, US), only China has such a potent impact on the selected LPCs' returns. World FDIRE does not have a significant impact. Very interestingly, a detailed analysis indicates that the identified impact is different by property types, with returns on hotel and multifamily properties witnessing the most potent influence from Chinese FDIRE. This seems to suggest that over the 10-year period under study, one common continental factor for APAC public real estate markets was linked to Chinese FDIRE. This result highlights our main contribution to the literature and echoes the seminal study conducted by Eichholtz et al. (1998) in the late 1990s.

This article is organized as follows. Section 3.2 presents the theoretical and empirical framework. Section 3.3 details the data and gives a brief overview of the heterogeneous markets. Section 3.4 is devoted to the analysis of our empirical results. Finally, section 3.5 reports our main conclusions.

3.2 Theoretical and Empirical Framework

In this paper we investigate the impact of the China-Hong Kong outward real estate investment (hereinafter, “CH-HK FDIRE”) on LPCs’ returns in eight neighboring countries of China² in the APAC region, using the unique database of Real Capital Analytics (RCA).³ RCA is considered one of the most comprehensive databases on commercial real estate transactions on a global scale.

Pavlov et al. (2015) investigated the drivers of the returns generated by international real estate securities and documented the significant role of macroeconomic factors play in explaining these returns. In this paper, we use the framework by Pavlov et al. (2015) to examine CH-HK FDIRE as a risk factor affecting LPCs’ returns.

We estimate the following model using fixed effect regression, as indicated by the Hausman test.

$$R_{jt} = \theta_0 + \theta_1 r_{wt} + \theta_2 r_{ct}^\perp + \theta_3 r_{et}^\perp + \theta_4 e_t + \theta_5 \lambda_t + \theta_6 i_{ft} + \theta_7 L1.FDIRE_{ft} + \theta_8 GDP_{ft} + \theta_9 GOV_{ft} + \theta_{10} DE_{jt} + \theta_{11} SIZE_{jt} + \theta_{12} REIT_j + w_{jt}$$

R_{jt} is the excess quarterly total return over the risk-free rate on security j , and r_{wt} represents the quarterly excess total returns of the MSCI world stock market index. Following Pavlov et al. (2015), we add a residual country factor, r_{ct}^\perp , extracted from

2. Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India, and Philippines. All of these countries are part of the Asian Development Bank’s definition of the APAC region.

3. We would like to thank Real Capital Analytics for providing us this data. The usual disclaimers apply.

the following projection:

$$r_{ct} = \alpha_c + \beta_c r_{wt} + \epsilon_{ct} \quad (3.1)$$

r_{ct} is the quarterly excess total return on country c 's main stock market index over the risk-free rate, r_{wt} is the quarterly excess MSCI world stock market total index returns, and ϵ_{ct} is the residual representing the orthogonalized country factor r_{ct}^\perp . Similarly to previous literature (Bond et al., 2003; Pavlov et al., 2015), we also control for a residual real estate factor from the following projection:

$$r_{et} = \alpha_e + \beta_{e1} r_{wt} + \beta_{e2} r_{ct} + \nu_{et} \quad (3.2)$$

r_{et} is the quarterly excess total return on country e 's Global Property Research General Quoted index over the risk-free rate, and ν_{et} is the residual representing the orthogonalized real estate factor r_{et}^\perp . We follow the approach developed by Vassalou (2000) and used by Pavlov et al. (2015) to control for exchange rate fluctuations.⁴ We decompose the foreign exchange rate of the respective currency relative to the US\$ into a common and residual component (e_t and λ_t). We choose the US\$ as a reference currency in this study due to the absence of a single dominant Asian currency. The variable i_{ft} represents unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). We use the lagged variable $L1.FDIRE_{ft}$ with a lag of 1 quarter (consistent with Fisher and Geltner 2000 and Clayton et al. 2001), which represents the log of CH-HK quarterly FDIRE in country f . GDP_{ft} is the quarterly log value of the GDP of country f . GOV_{ft} is the equally weighted average, per country and year, of six governance indicators provided by the Worldwide Governance Indicators (WGI) to control for country-level governance. We also control for the size of the firm, proxied by the log of the market value of the firm ($SIZE_{jt}$) and for its debt-to-equity ratio (DE_{jt}). We use a dummy variable to control for the REIT status, and w_{jt} is the error term. We use two different panel specifications. The first one is time and country fixed effects, and the second specification is time

4. For brevity, we do not detail the methodology.

and firm fixed effects. We cluster standard errors at the firm level.

Robustness checks

To test the robustness of the results, we conducted both full-sample and subsample countries analyses. The full-sample countries analysis includes Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India, and Philippines. The subsample (Asia sample countries) includes all aforementioned countries except Australia. We also report in the Appendices the results of a subsample that includes only Japan and Australia.

We take into consideration the subsector representation by splitting our sample of companies into four real estate subsectors: Diversified; Office and Industrial; Other Retail, Regional Malls and Shopping centers; Hotel and Multifamily.

To test whether the results are simply due to the impact of the overall FDIRE or to CH-HK specific FDIRE, we re-estimate multiple models, replacing the CH-HK FDIRE with one of the following: (1) the World (excluding CH-HK) FDIRE; (2) the US FDIRE; and (3) the Japan FDIRE.

3.3 Data Sources and Descriptive Statistics

Our sample consists of 211 distinct LPCs from eight countries, obtained from SNL Real Estate's database over the 2007-2017 sample period. The LPCs' financial data and the countries' main stock market indices are from Thomson Reuters Datastream. We use the Global Property Research (GPR) database for the national listed property indices. More specifically, we use the GPR General Quoted Index.⁵ The choice of sample countries was made on the availability of data. Table 3.1 shows the distribution of our sample companies per country. The majority of the LPCs are from Singapore (56) and Japan (55), followed by Australia (38), Malaysia (18), India (14), Thailand (13), Indonesia (9), and Philippines (8). The

5. According to the GPR website, the General Quoted Index is the longest running index in their database, with an inception date of 31 December 1983. The GPR General Quoted Index contains all listed real estate companies that comply with their applied rules, excluding open-end bank funds. This makes it their broadest index product.

largest LPCs (as proxied by mean market value) are located in Philippines (US\$3.6 billion), Japan (US\$3.1 billion), and Australia (US\$2.9 billion). We also notice that the LPCs located in the latter three countries hold, on average, a higher number of properties. The properties' data are collected from SNL Real Estate's database.

Table 3.1 – Descriptive statistics for the country-level LPCs

	Number of LPCs	Mean Market Value	Mean Number of Properties	REIT status dummy	N
Australia	38	2891	74	0.89	1129
India	14	1232	24	0.00	566
Indonesia	9	1079	45	0.00	290
Japan	55	3153	64	0.76	1880
Malaysia	18	698	19	0.28	548
Philippines	8	3648	115	0.00	240
Singapore	56	1718	36	0.60	1783
Thailand	13	957	44	0.00	535

This table provides the summary statistics for a total of the 211 sample LPCs over the 2007-2017 sample period. Mean Market Value indicates the average market value calculated as the end-of-year price multiplied by number of shares outstanding over the study period (in US\$ million). This table also presents the average number of properties held by the sample LPCs. REIT status dummy is variable that takes the value of 1 if the LPC has adopted REIT legislation, 0 otherwise. N is the number of observations. Data presented in this table is collected from Thomson Reuters Datastream and SNL Real Estate's database.

As shown in Table 3.2, the average quarterly excess total returns across all of the sample LPCs is 2.82%. The LPCs in Thailand scored the highest average quarterly excess total returns, at 6.44%, while the LPCs in India registered the lowest average, at 1.18%. The average returns achieved in the other markets, ranked from highest to lowest, are as follows: Philippines (4.76%), Malaysia (3.41%), Indonesia, (2.86%), Singapore (2.82%), Australia (2.73%), and Japan (1.92%). The average standard deviation of quarterly returns is 21.63%. Countries with below-average performance tend to be less volatile (except for India). The median return is lower than the mean in all of the sample countries except for Thailand; that is, the return distribution is positively skewed over the 2007-2017 sample period.

Table 3.2 – Quarterly total returns for country-level LPCs

	Mean return	Median return	S.D.	N
Australia	2.73	3.01	21.10	1129
India	1.18	-3.69	31.52	566
Indonesia	2.86	-0.01	38.02	290
Japan	1.92	0.00	16.01	1880
Malaysia	3.41	1.16	22.90	548
Philippines	4.76	2.10	21.66	240
Singapore	2.83	1.80	17.55	1783
Thailand	6.44	3.86	25.23	535
Total	2.82	0.93	21.63	6971

This table shows the mean and median quarterly excess total returns (in percentage) of the 211 sample LPCs over the 2007-2017 sample period. S.D. stands for the standard deviation. N is the number of observations. Data presented in this table is collected from Thomson Reuters Datastream.

Table 3.3 describes the macroeconomic control variables and variables of interest. The average MSCI index return, on a quarterly basis, is 1.68%, compared to -0.32% and -0.16 for the country and real estate residuals. The MSCI risk level (8.6%), as measured by the standard deviation, is higher than that of the country (5%) and real estate (3.6%) residuals. On average, the inflation rate, as measured by the consumer price index quarterly change, is 0.86%. During the 2007-2017 period, the quarterly CH-HK FDIRE amounted to, on average, US\$ 166 million in the full-sample countries, whereas the quarterly World FDIRE (excluding CH-HK)

registered US\$ 2.5 billion during the same period in the Asia sample countries. The country governance equaled 0.44 knowing that WGI governance indicators range from -2.5 to 2.5 (Kaufmann et al., 2010).

Table 3.3 – Descriptive statistics for the macroeconomic variables

	Mean	Median	S.D.
Risk-free rate	0.054	0.010	0.108
MSCI	1.685	2.454	8.583
Country residual	-0.318	0.272	5.031
Real estate residual	-0.156	0.370	3.599
Currency residual	0.073	-0.031	0.992
Common currency factor	-0.133	-0.587	2.746
Inflation	0.861	0.711	0.996
Unexpected inflation	0.184	0.201	0.820
CH-HK quarterly FDIRE (US\$ million)	166.164	112.798	142.568
Log of CH-HK quarterly FDIRE	7.772	9.033	3.362
World quarterly FDIRE excluding CH-HK (US\$ million)	2539.999	2293.375	1082.485
Quarterly GDP (US\$ billion)	328.007	330.426	29.664
Log of quarterly GDP	25.895	25.969	0.151
Country governance	0.441	0.443	0.061

This table shows the descriptive statistics, which include means, median and standard deviation for the macroeconomic variables over the 2007-2017 sample period. Data presented in this table is collected from Thomson Reuters Datastream, World Bank, International Finance Statistics and Kenneth R. French's website.

Table 3.4 shows the correlation levels between the variables. The correlation matrix reveals, overall, a low level of correlations, indicating that there are no multicollinearity problems among the variables. One exception is the highly positive correlation of the country governance level and the log of FDIRE, which indicates that FDIRE is attracted to countries that exhibit a good level of governance.

Table 3.4 – Correlation matrix for the variables

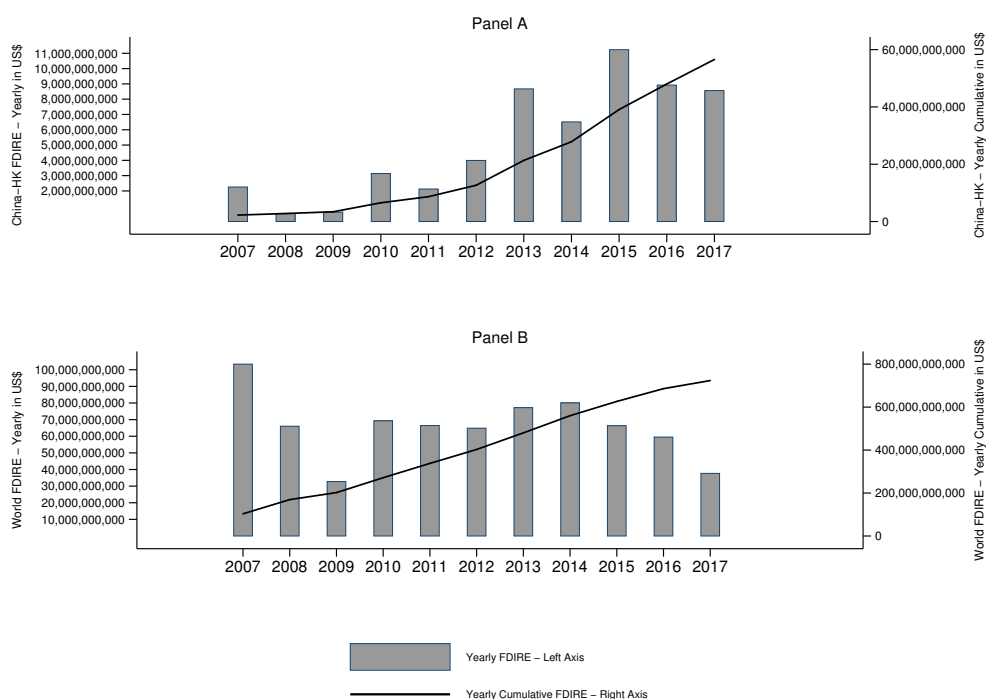
	MSCI	CTRY	RERES	FXRES	FXCOM	UIN	Log of FDIRE	Log of GDP	Country governance	DE ratio	log firm size	REIT status
MSCI	1											
CTRY	-0.0396**	1										
RERES	-0.0322**	-0.0199	1									
FXRES	-0.0199	-0.277***	-0.0804***	1								
FXCOM	-0.610***	-0.255***	-0.0599***	0.232***	1							
UIN	0.135***	-0.0973***	-0.121***	0.0305*	-0.0597***	1						
Log of FDIRE	0.0353**	-0.0959***	-0.00445	0.0743***	0.0794***	-0.00447	1					
Log of GDP	0.0224	0.0162	-0.0328**	0.0253*	-0.00799	0.00677	0.163***	1				
Country governance	0.00493	0.0350**	-0.0167	0.0113	0.00547	-0.0577***	0.660***	0.172***	1			
DE ratio	-0.00935	0.00735	0.00314	-0.00514	0.0116	-0.0201	-0.0281*	0.194***	-0.0648***	1		
log firm size	0.0976***	0.0232	-0.0147	0.0302*	-0.0262*	-0.00733	0.231***	0.129***	0.248***	-0.0376**	1	
REIT status	0.00741	0.0221	-0.0170	0.00948	0.00476	-0.0355**	0.421***	0.276***	0.618***	-0.138***	0.0694***	1

This table presents the correlation matrix between the variables used in the paper. **MSCI** is the quarterly total return on the MSCI world stock market index. **CTRY** is the residual country factor. **RERES** is the residual country factor. **RERES** is the residual country real estate factor. **FXRES** and **FXCOM** represent residual and common currency factors. **UIN** is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). **Log of FDIRE** is the log of CH-HK quarterly outward real estate investment in the respective country collected from Real Capital Analytics. **Log of GDP** is the quarterly log value of GDP of the relevant country. **Country governance** is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. **DE ratio** is the debt-to-equity ratio. **log firm size** is the log of the market value of the firm. **REIT status** is a dummy variable that takes the value of one if the firm has adopted the REIT status.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The data on CH-HK FDIRE were obtained from RCA. The total CH-HK FDIRE in our sample countries (Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India, and Philippines) has increased by around 25 times over the 2007-2017 period (Panel A of Figure 3.1). We also notice from the same figure that the yearly cumulative CH-HK FDIRE is almost following an exponential curve, which is representative of Chinese real estate players' rapid internationalization.

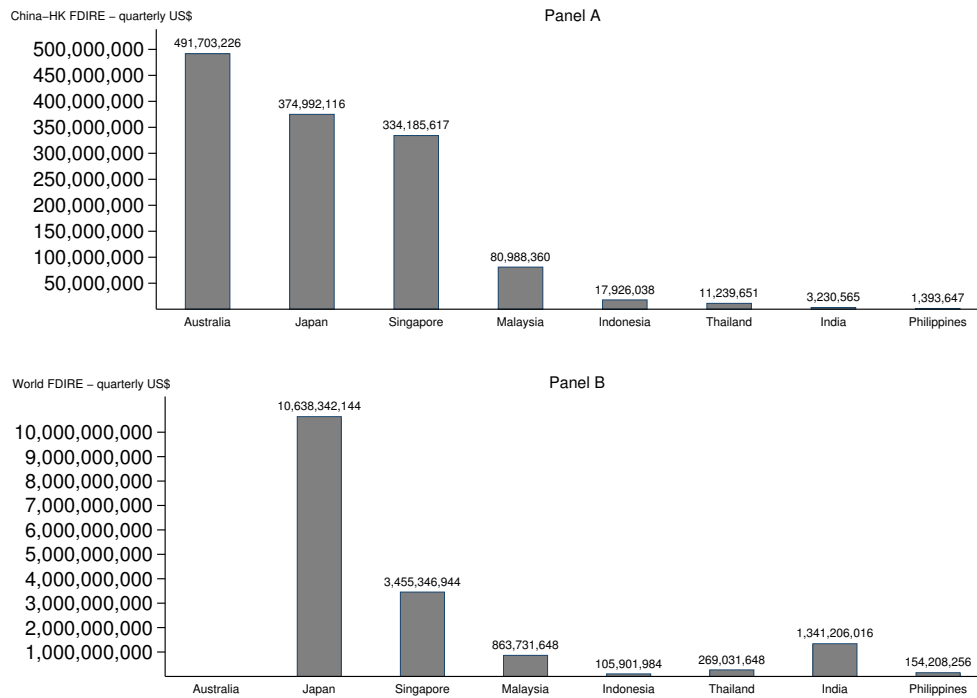
Figure 3.1 – CH-HK and World FDIRE in our sample countries



Panel (A) of this figure plots the yearly CH-HK FDIRE (left axis) and yearly cumulative CH-HK FDIRE (right axis) in the full-sample countries (Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India, and Philippines). Panel (B) shows the yearly World (excluding CH-HK) FDIRE (left axis) and yearly cumulative World (excluding CH-HK) FDIRE (right axis) in the Asia sample countries (excluding Australia due to non-access to data). Source: Real Capital Analytics.

Panel A of Figure 3.2 shows the geographical distribution of the CH-HK FDIRE, on an average quarterly basis, in our sample countries over the period 2007-2017. Australia accounted for a significant amount of the CH-HK FDIRE, followed by Japan, Singapore, Malaysia, Indonesia, Thailand, India, and Philippines.

Figure 3.2 – Quarterly Average FDIRE by Destination



Panel (A) of this figure plots the quarterly average CH-HK FDIRE by destination. Panel (B) shows the quarterly average World (excluding CH-HK) FDIRE by destination. Data for Australia is missing due to non-access to data. Source: Real Capital Analytics.

3.4 Empirical Results

3.4.1 Main results

We test the main model presented in Section 3.2 to analyze the impact of Chinese FDI in real estate (CH-HK FDIRE) on APAC LPCs. Table 3.5 reports the estimation results of the panel models. First, we consider full sample (including Australia). Second, we apply the economic modeling to a subsample of only Asian countries (excluding Australia). We estimate the model using two different but complementary approaches. Time and country fixed effects are included in column (1), while column (2) reports time and firm fixed effects.

The results related to the MSCI world stock market index (*MSCI*), the residual country factor (*CTRY*), and the residual country real estate factor (*RERES*) indicate a positive and highly statistically significant impact on the LPCs' returns. These results are consistent with previous literature investigating public real estate returns (Ling and Naranjo, 2002; Bond et al., 2003; Hoesli and Oikarinen, 2012;

Pavlov et al., 2015). We observe, as expected, a negative link between the LPCs' returns and the residual currency factor (*FXRES*) that measures the specific fluctuations in the individual exchange rates. Adopting an international investor's perspective, this result is consistent with the argument that a devaluation of the domestic currency implies a decline in the LPCs' returns. The common currency factor (*FXCOM*) measuring movements, which tend to be common across all exchange rates, is not statistically significant.

Consistent with the framework of Fama and Schwert (1977), our findings show that LPCs act as an inflation hedge. This result is also consistent with that of Hudson-Wilson et al. (2003) and Pavlov et al. (2015), among others. As expected, the *LogGDP* and *Logfirmsize* are highly statistically significant at 1%, while the *Country governance* and the *debt-to-equity ratio* are not significant. Our results also reveal that the adoption of a REIT status leads to an increase in the LPCs' returns. The larger LPCs studied during this period tend to exhibit higher returns.

The coefficient of the variable of interest *L.LogofFDIRE* is highly statistically significant and positive, as reported in columns (1) and (2) for the full sample of countries (including Australia) and for the subsample of Asian countries. The estimate for the full sample of countries, which is around 0.12 (0.116 for country fixed effects and 0.126 for firm fixed effects), is slightly higher than for the sample of Asian countries, which is around 0.10 (0.098 with country fixed effects and 0.105 with firm fixed effects). This difference may be explained by the higher level of CH-HK FDIRE in Australia compared to other countries (as shown and illustrated in Panel A of Figure 3.2). These results imply that a 1% increase in the Chinese FDIRE increases the LPCs' quarterly returns by 0.12% for the full-sample countries (including Australia) and by 0.10% for the subsample of Asian countries.

Table 3.5 – The impact of Chinese FDI in real estate on Asian-Pacific LPCs

	Full-sample countries		Asia sample countries	
	(1)	(2)	(1)	(2)
MSCI	2.069*	3.578***	3.420***	4.670***
	1.10	1.15	1.30	1.35
CTRY	1.145***	1.127***	1.188***	1.169***
	0.06	0.06	0.06	0.06
RERES	0.593***	0.593***	0.619***	0.627***
	0.05	0.05	0.05	0.06
FXRES	-5.055**	-6.804***	-3.524	-5.808**
	2.03	2.03	2.25	2.28
FXCOM	0.0815	1.515	1.071	2.256
	1.36	1.39	1.62	1.65
UIN	0.751**	0.688**	0.837**	0.747**
	0.33	0.33	0.33	0.33
L.Log of FDIRE	0.116***	0.126***	0.0908**	0.105***
	0.04	0.04	0.04	0.04
Log of GDP	7.637***	9.492***	6.518***	8.063***
	1.65	1.88	1.74	1.99
Country governance	-0.274	-3.312	3.348	-1.798
	4.04	4.20	5.58	5.47
DE ratio	-0.00101	0.000347	-0.00151	0.000122
	0.00	0.00	0.00	0.00
log firm size	0.382**	4.874***	0.503***	5.115***
	0.18	0.57	0.16	0.62
REIT status	0.831***		0.979***	
	0.28		0.31	
Constant	-209.7***	-289.1***	-186.7***	-258.8***
	45.32	50.11	46.50	53.30
Firm Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	No
Firm clusters	207	207	169	169
Adjusted R-Square	0.466	0.478	0.461	0.472
F	106.8	132.5	105.6	127.3
N	6541	6541	5482	5482

*This table presents the results of the dependent variable, quarterly excess firm returns, regressed on the lagged (by one trimester) variable of interest CH-HK FDIRE. We control for the macroeconomic and firm-level variables. Columns (1) present the regression results using Time and Country fixed effects. Columns (2) present the regression results using Time and Firm fixed effects. **Full-sample countries** includes Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India and Philippines. In **Asia sample countries**, we exclude Australia. **MSCI** is the quarterly total return on the MSCI world stock market index. **CTRY** is the residual country factor. **RERES** is the residual country real estate factor. **FXRES** and **FXCOM** represent residual and common currency factors. **UIN** is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). **L.Log of FDIRE** is the lagged log of CH-HK quarterly outward real estate investment in the respective country collected from Real Capital Analytics. **Log of GDP** is the quarterly log value of GDP of the relevant country. **Country governance** is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. **DE ratio** is the debt-to-equity ratio. **log firm size** is the log of the market value of the firm. **REIT status** is a dummy variable that takes the value of one if the firm has adopted the REIT status. Standard Errors are clustered at the firm level.*

**** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.*

To test the robustness of these findings, we also apply our asset pricing model to a subsample that includes Japan and Australia exclusively. As described before, Australia and Japan are indeed the most developed markets for LPCs in the APAC. Table C1 in the appendices confirms our previous results, highlighting the role played by CH-HK FDIRE on the LPCs' returns. $L.LogofFDIRE$ is still positive and highly statistically significant. The estimates range from 0.246 (significant at 1%) for country fixed effects to 0.214 (significant at 5%) for firm fixed effects.

3.4.2 The relative importance of Chinese FDIRE

To analyze the relative importance of CH-HK FDIRE on the dynamics of LPCs' returns, we replace CH-HK FDIRE with other empirical metrics. We proceed in two steps. First, we introduce and define the variable $World - FDIRE$. This variable includes all FDIRE from all around the world towards our sample countries, excluding $CH - HK - FDIRE$ (The results are reported in Table C2). Second, to refine our analysis, we use two metrics: (1) FDIRE originating from the US ($US - FDIRE$: Table C3) and (2) FDIRE originating from Japan ($Japan - FDIRE$: Table C4). These empirical metrics are computed using the RCA database.

Very interestingly, our results shown in Tables C2, C3, and C4 in the appendices clearly indicate that FDIRE originating from these different countries do not have a significant impact on the Asian LPCs' returns during the study period. These findings are striking and confirm the relevance of our hypotheses, shedding light on this paper's contribution to the analysis of China's investment strategy. It implies that CH-HK FDIRE clearly matter in the APAC during the 2007-2017 period, whereas non-Chinese FDIs do not, highlighting the relative importance of Chinese FDIs in real estate on the dynamics of the APAC LPCs' returns.

3.4.3 Results by real estate subsector

To scrutinize the real impact of CH-HK FDIRE on the APAC LPCs, we divide our full sample into four subsamples following the nomenclature defined by NAREIT (National Association of Real Estate Investment Trusts) and EPRA (European Public Real Estate): (1) Diversified; (2) Office and Industrial; (3) Other Retail, Regional Malls, and Shopping Centers; and (4) Hotel and Multifamily. We use the same econometric approach as previously described, controlling for time and country fixed effects in the first modeling, and for time and firm fixed effects in the second one.

Table 3.6 – Regression results for the full-sample countries by subsector

	Diversified		Office and Industrial		Other Retail, Regional Malls and Shopping centers		Hotel and Multifamily	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
MSCI	2.516	3.798**	2.827	5.103**	-1.060	0.606	5.824	6.989*
	1.82	1.89	2.34	2.41	2.86	2.93	3.61	3.67
CTRY	1.233***	1.213***	1.127***	1.100***	0.759***	0.731***	1.061***	1.028***
	0.08	0.08	0.08	0.08	0.09	0.09	0.11	0.11
RES	0.573***	0.573***	0.867***	0.871***	0.515***	0.499***	0.501***	0.517***
	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.10
FXRES	-2.935	-4.032	-5.048	-8.274**	-5.648	-6.703	-16.08***	-20.43***
	3.33	3.31	3.68	3.78	4.59	4.65	5.68	5.82
FXCOM	-0.246	0.976	1.900	4.118*	-1.907	-0.382	2.973	3.932
	2.35	2.42	2.35	2.43	2.92	2.98	3.71	3.76
UIN	1.192**	1.077**	-0.383	-0.354	-0.399	-0.378	0.605	0.540
	0.48	0.47	0.65	0.65	0.79	0.79	0.68	0.68
L.Log of FDIRE	0.129***	0.144***	0.0662	0.0791	-0.0324	-0.0168	0.329***	0.307***
	0.05	0.05	0.07	0.07	0.07	0.07	0.11	0.11
Log of GDP	7.910***	9.065***	4.200	5.982	4.270	2.738	15.05***	24.26***
	2.31	2.67	3.39	3.64	4.46	4.68	4.74	5.60
Country governance	-3.627	-7.168	-3.806	0.579	2.412	0.154	19.00	-1.535
	5.04	5.23	10.27	11.17	9.48	10.20	14.76	15.75
DE ratio	-0.000546	-0.000932	-0.0202*	-0.0328*	0.00392	0.0387	-0.00318*	-0.000538
	0.01	0.01	0.01	0.02	0.02	0.02	0.00	0.00
log firm size	0.725***	5.386***	0.414	4.885***	-0.101	5.041***	0.993*	6.342***
	0.22	0.72	0.36	1.11	0.39	1.62	0.53	1.50
REIT status	0.747		0.231		0.633		0.559	
	0.62		1.80		2.01		1.55	
Constant	-217.6***	-281.3***	-110.9	-202.3*	-107.0	-107.9	-420.8***	-702.0***
	61.33	69.41	99.66	105.65	121.49	123.63	130.77	156.13
Firm Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	No	Yes	No	Yes	No
Firm clusters	109	109						
Adjusted R-Square	0.432	0.444	0.618	0.616	0.557	0.551	0.534	0.531
F	105.2	146.5	34.91	38.06	18.06	19.86	17.75	19.39
N	3688	3688	1110	1110	734	734	777	777

This table presents the results for our full-sample countries after splitting our sample of firms into four real estate subsectors: **Diversified - Office and Industrial - Other Retail, Regional Malls and Shopping centers - Hotel and Multifamily**. The dependent variable, quarterly excess firm returns, regressed on the lagged (by one trimester) variable of interest CH-HK FDIRE. We control for the macroeconomic and firm-level variables. Columns (1) present the regression results using Time and Country fixed effects. Columns (2) present the regression results using Time and Firm fixed effects. MSCI is the quarterly total return on the MSCI world stock market index. CTRY is the residual country factor. RES is the residual country real estate factor. FXRES and FXCOM represent residual and common currency factors. UIN is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). L.Log of FDIRE is the lagged log of CH-HK quarterly outward real estate investment in the respective country collected from Real Capital Analytics. Log of GDP is the quarterly log value of GDP of the relevant country. Country governance is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. DE ratio is the debt-to-equity ratio. log firm size is the log of the market value of the firm. REIT status is a dummy variable that takes the value of one if the firm has adopted the REIT status. Standard Errors are clustered at the firm level only at the Diversified subsector. Estimation results show an F-statistic reported to be missing when clustering standard errors for the other subsectors. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

Table 3.6 reports the results for the full sample of eight countries divided into four real estate subsectors. This division sheds light on Chinese FDI strategies in the APAC real estate sector. To our knowledge, we are the first to report robust results on this investment strategy in real estate economics, highlighting one of our contributions. While all estimates are consistent with our previous results and with the real estate finance and economics literature, we focus on the variable of interest CH-HK FDIRE. As reported in Table 3.6, the FDIRE is highly statistically significant at 1% for the *Diversified* subsector (0.129 with country fixed effects and 0.144 with firm fixed effects), and for the *Hotel and Multifamily* subsector (0.329 and 0.307 respectively). In addition, we observe that the estimates related to CH-HK FDIRE are not statistically significant for *Office and Industrial* and for *Other Retail, Regional Malls and Shopping Centers* subsectors. These findings illustrate and shed new light on China's strategies for the APAC real estate sector. The results show that CH-HK FDIRE in APAC is influencing mostly the *Diversified LPCs* and *Hotel and Multifamily LPCs*.

3.5 Conclusion

In this article, we analyze the role played by Chinese FDI in APAC real estate markets dynamics after the global financial crisis. We consider eight countries in the APAC region, including Australia, India, Indonesia, Japan, Malaysia, Philippines, Singapore, and Thailand. We use and develop a linear asset pricing model including macroeconomic risk factors. Based on the RCA and SNL Real Estate databases, we compute multiple metrics to measure the Chinese, US, and Japanese FDIs in the real estate sector. Panel econometrics methods are used to test the economic model.

Our robust results report a positive significant impact of CH-HK FDIRE on APAC public real estate returns, while FDIRE originating from outside China are not significant. These results shed light on the Chinese investment strategy in the APAC region. To scrutinize the role played by Chinese FDIs, we split our sample of Asian and Pacific LPCs into four real estate subsectors: (1) *Diversified LPCs*;

(2) *Office and Industrial*; (3) *Other Retail, Regional Malls and Shopping centers LPCs* and (4) *Hotel and Multifamily LPCs*. We show that Chinese investors use the channel of FDIs in *Diversified LPCs* and *Hotel and Multifamily LPCs* to apply the *Belt and Road Initiative* strategies in Asia and Australia.

Conclusion générale

Cette thèse a examiné des thématiques liées au processus de l'investissement des sociétés immobilières cotées et avait pour ambition de contribuer à l'étude de l'immobilier coté et d'apporter de nouveaux développements en la matière, dans le but d'aider les investisseurs et les décideurs politiques à mieux comprendre certains aspects de l'immobilier coté.

Le premier chapitre s'est intéressé à l'analyse du phénomène du « biais domestique » qui a longtemps constitué une énigme pour les chercheurs. En utilisant la base de données de SNL, nous avons montré que le surinvestissement des REITs américaines dans un marché géographique particulier est motivé par les options de croissance dont disposent ces REITs.

À travers le second chapitre de ce manuscrit, nous nous sommes interrogés sur les conséquences des « biais » de localisation observés au sein du premier chapitre. En utilisant un échantillon de foncières européennes cotées et après avoir dissocié les sociétés « financiarisées » de celles « non financiarisées », nous avons documenté le rôle de la stratégie d'investissement effectuée par le groupe des sociétés foncières financiarisées dans l'approfondissement des processus de métropolisation dans dix pays européens (Belgique, France, Allemagne, Suède, Suisse, Royaume-Uni, Finlande, Italie, Pays-Bas et Espagne).

En considérant le secteur de l'immobilier coté comme un champ d'expérimentation, le troisième chapitre de cette thèse a identifié un facteur continental pour les marchés immobiliers dans huit pays de l'Asie-Pacifique (Australie, Japon, Inde, Indonésie, Malaisie, Philippines, Singapour et Thaïlande). Au cours de la période étudiée, les résultats ont montré que ce facteur est principalement dû aux inves-

tissements directs étrangers chinois dans ces marchés.

Enfin, nous soulignons les contributions de ce travail de recherche, ses limites ainsi que les pistes de réflexion future. Le premier chapitre constitue, à notre connaissance, la première étude qui a exploré empiriquement le concept des options de croissance en tant que facteur explicatif de la déviation de la théorie moderne du portefeuille qu'est « le biais domestique ». Il convient de noter une limite des résultats de ce premier chapitre. Nous avons décomposé le bêta de chaque firme en son bêta d'actifs en place et son bêta d'options de croissance, en considérant comme hypothèse que le risque est linéaire. Une piste de recherche future est d'adresser cette hypothèse en proposant une modélisation des options de croissance basée sur un modèle non linéaire. Une autre piste de recherche prometteuse serait d'étendre cette étude à d'autres industries.

Le second chapitre a apporté une définition empirique robuste au concept de financiarisation des sociétés foncières cotées. Nous ne connaissons pas de recherche ayant examiné d'une façon rigoureuse et empirique l'interaction entre l'évolution des cours boursiers et les dynamiques de la métropolisation à travers des techniques d'arbitrage basées sur des analyses de couple risque/rendement. Élargir l'étude à d'autres types de véhicules d'investissements, notamment les fonds immobiliers qui demeurent par exemple les acteurs majeurs du marché immobilier en Allemagne, permettrait ainsi de déterminer si l'immobilier coté est (ou pas) le principal canal d'intégration entre les institutions des marchés financiers et l'environnement urbain bâti.

Les résultats du dernier chapitre ont mis l'accent sur l'importance de la diversification intercontinentale pour les investisseurs dans l'immobilier coté en bourse en Asie-Pacifique. Diversifier leurs placements en investissant dans les marchés d'autres continents pourrait être un moyen de gérer le « risque chinois ». Le choix d'opter pour une diversification géographique dépend de la situation spécifique de chaque investisseur qui devrait faire un compromis entre les gains prévus d'une stratégie de concentration géographique plus risquée (e.g., des rendements plus

élevés associés aux options de croissance présentés dans le premier chapitre) et les avantages de la diversification géographique (e.g., la réduction du risque systématique). Une perspective de recherche intéressante serait d'examiner l'existence ou non d'un facteur continental sur le marché de l'immobilier direct en Asie-Pacifique.

Annexes

Annexe 1

Table A1 – Growth options and assets-in-place betas and their mean differences by geographical concentration and by different subperiods

	1995-2017 (Full sample period)			2002-2007 (excluding GFC)			2002-2017 (REIT maturity era)		
	GO	AIP	Diff	GO	AIP	Diff	GO	AIP	Diff
	<i>All sample REITs</i>			<i>All sample REITs</i>			<i>All sample REITs</i>		
	0.434	0.324	0.109**	0.325	0.147	0.178*	0.467	0.360	0.107*
<i>p-value</i>			0.025			0.052			0.097
	<i>HOME_CONC</i>			<i>HOME_CONC</i>			<i>HOME_CONC</i>		
<i>Concentrated REITs</i>	0.470	0.312	0.158***	0.342	0.158	0.183**	0.508	0.356	0.151***
<i>p-value</i>			0.0006			0.029			0.007
<i>non-concentrated REITs</i>	0.385	0.339	0.045	0.269	0.157	0.113	0.412	0.370	0.041
<i>p-value</i>			0.541			0.325			0.631
	<i>SINGLE_CONC</i>			<i>SINGLE_CONC</i>			<i>SINGLE_CONC</i>		
<i>Concentrated REITs</i>	0.456	0.311	0.145**	0.404	0.105	0.299***	0.477	0.363	0.114
<i>p-value</i>			0.016			0.0029			0.113
<i>non-concentrated REITs</i>	0.382	0.344	0.038	0.206	0.207	-0.001	0.451	0.359	0.09
<i>p-value</i>			0.546			0.996			0.208
	<i>HHI</i>			<i>HHI</i>			<i>HHI</i>		
<i>Concentrated REITs</i>	0.455	0.307	0.147**	0.410	0.0975	0.312***	0.478	0.359	0.119*
<i>p-value</i>			0.011			0.0017			0.08
<i>non-concentrated REITs</i>	0.391	0.342	0.048	0.216	0.204	0.011	0.466	0.354	0.111
<i>p-value</i>			0.485			0.907			0.153

This table reports the averages of growth options (*GO*) and assets-in-place (*AIP*) betas and the mean differences (*Diff*) between them for concentrated, non-concentrated, and all sample equity REITs across different subperiods. We sort firms into two equal groups (concentrated and non-concentrated) based on each of the three geographic measures as of each year. *HOME_CONC* measure is defined as the percentage of a firm's total property portfolio located in the headquarters market. *SINGLE_CONC* is defined as the largest percentage of a firm's total property portfolio located in any market, that may include the firm's headquarters location, within a particular year. *HHI* is the Herfindahl-Hirschman Index of a firm's geographic property portfolio concentration, including investments in their headquarters market. Concentration measures are computed using the variable "adjusted cost" collected from SNL Real Estate's database. We estimate monthly equity betas using a five-year rolling (three-year minimum) Fama-French Three-Factor Model: a market factor (*mkt*), a size factor (*smb*), and a value factor (*hml*). We then compute the average beta of each firm every year using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered beta. *GO* and *AIP* betas are computed for each of the concentrated and non-concentrated group, every year, using the averages of unlevered betas and firm book value of assets to market value of assets (*B/M*) ratio of two portfolios of firms created based on their *B/M* ratios. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

Table A2 – Growth options and assets-in-place betas and their mean differences by geographical concentration and by connectedness

Geographical concentration level	Connectedness level	GO	AIP	Diff
High <i>p-value</i>	High	0.55	0.39	0.16* 0.07
High <i>p-value</i>	Low	0.51	0.40	0.11* 0.09
Low <i>p-value</i>	High	0.48	0.39	0.09 0.53
Low <i>p-value</i>	Low	0.40	0.42	-0.02 0.86

We report the averages of growth options (**GO**) and assets-in-place (**AIP**) betas and the mean differences (**Diff**) between them for our sample equity REITs during the 2002-2017 period. BoardEx started collecting information on companies in North America in 2003 and backfilled the data to 2000. For comparability reasons, we restrict this analysis to the 2002-2017 period. We sort firms into two groups (High and Low concentrated) at the geographical concentration level and two groups at the connectedness level (High and Low connected). We then construct four portfolios from the intersection of the two concentration and the two connectedness groups. We use *HOME_CONC* as a concentration measure, which is defined as the percentage of a firm's total property portfolio located in the headquarters market. It is computed using the variable "adjusted cost" collected from SNL Real Estate's database. To determine each REIT's level of connectedness, we use the social network database from BoardEx which provides detailed biographical information (gender, citizenship, education, employment history, non-profit affiliations, etc.) on directors and top executives of public and private companies as well as not-for-profit organizations. For each year we extract the network size of each board member (number of connections with individuals outside the company via historical overlapping experience) of each REIT. We then take the average number of connections of a REIT's board members as a REIT's measure of connectedness. We estimate monthly equity betas using a five-year rolling CAPM (three-year minimum). We then compute the average beta of each firm, every year, using the monthly estimated betas. We filter the average beta of each firm for this particular year through the Hamada equation to get the corresponding unlevered beta. **GO** and **AIP** betas are computed, every year, for each of the four portfolios (High-High, High-Low, Low-High, Low-Low) using the averages of unlevered betas and firm book value of assets to market value of assets (*B/M*) ratio of two portfolios of firms created based on their *B/M* ratios. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

Annexe 2

Table B1 – Description of the variables

Variable	Description
Institutional ownership	Percentage of shares held by shareholders classified as institutional investors by Thomson Reuters (Thomson Reuters Ownership Database)
Closely-held shares	Percentage of shares held by insiders (Worldscope [WC05474])
Firm size	Market value of the firm (Thomson Reuters Datastream [MV])
Number of analyst following	We collect the number of analysts making an earnings per share forecast. We select the closest date to the actual earnings announcement by the company. If number of analyst is missing it means no analyst following (I/B/ES).
Forecast error	$\left \frac{\text{actual or reported earnings} - \text{mean estimate}}{\text{actual or reported earnings}} \right $ Forecast error is equal to 1 if we have no analyst following the company (I/B/ES).
Forecast dispersion	$\left \frac{\text{std deviation of analyst estimates}}{\text{mean estimate earnings}} \right $ In case we have no or only one analyst following the company, we will have standard deviation equal to 0, thus we replace the forecast dispersion by 1 (I/B/ES) .
Leverage	Long-term debt (dltt) plus short-term debt (dlc) divided by equity value (Compustat).
Market-to-Book	Equity value (share price, prcc, times number of shares outstanding, csho) divided by book equity (ceq) plus deferred taxes (txdb), as of 2005 (Compustat).
Amihud ratio	We compute: $A_{iy} = \frac{D_{iy}}{D_{iy}} \sum_{t=1}^{D_{iy}} \frac{ R_{it} }{Dvol_{it}}$. Where A_{iy} is the illiquidity measure for company i on month y; D_{iy} is the number of days in month t for which data are available for company i (companies with less than 10 valid return observations in a month are excluded); R_{it} is the absolute return on day t for company i; $Dvol_{it}$ is the dollar volume for company i on day t computed as price \times trading volume. We compute the annual average of this ratio (Thomson Reuters Datastream).
bid-ask spread	We compute: $\frac{\text{askprice} - \text{bidprice}}{\text{closeprice}}$ with daily data then we compute the yearly average of this ratio (Thomson Reuters Datastream).

Annexe 3

Table C1 – Regression results for the subsample countries: Japan and Australia

	(1)	(2)
MSCI	4.363***	5.486***
	1.63	1.56
CTRY	0.811***	0.773***
	0.13	0.13
RERES	0.690***	0.683***
	0.10	0.10
FXRES	-9.031***	-8.139***
	2.21	2.03
FXCOM	2.307	3.417*
	1.85	1.74
UIN	0.833	0.985
	0.79	0.81
L.Log of FDIRE	0.246***	0.214**
	0.09	0.09
Log of GDP	20.75***	20.32***
	4.24	4.53
Country governance	21.87***	18.14**
	7.62	7.13
DE ratio	-0.000156	0.00266
	0.00	0.01
log firm size	0.270	4.223***
	0.30	0.71
REIT status	1.328***	
	0.49	
Constant	-601.4***	-631.2***
	121.29	130.80
Firm Fixed Effects	No	Yes
Time Fixed Effects	Yes	Yes
Country Fixed Effects	Yes	No
Firm clusters	93	93
Adjusted R-Square	0.477	0.490
F	138.7	156.9
N	2858	2858

*This table presents the results for the sub-sample countries Japan and Australia. The dependent variable, quarterly excess firm returns, is regressed on the lagged (by one trimester) variable of interest CH-HK FDIRE. We control for the macroeconomic and firm-level variables. Columns (1) present the regression results using Time and Country fixed effects. Columns (2) present the regression results using Time and Firm fixed effects. **MSCI** is the quarterly total return on the MSCI world stock market index. **CTRY** is the residual country factor. **RERES** is the residual country real estate factor. **FXRES** and **FXCOM** represent residual and common currency factors. **UIN** is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). **L.Log of FDIRE** is the lagged log of CH-HK quarterly outward real estate investment in the respective country collected from Real Capital Analytics. **Log of GDP** is the quarterly log value of GDP of the relevant country. **Country governance** is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. **DE ratio** is the debt-to-equity ratio. **log firm size** is the log of the market value of the firm. **REIT status** is a dummy variable that takes the value of one if the firm has adopted the REIT status. Standard Errors are clustered at the firm level. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.*

Table C2 – Regression results for Asia sample countries using World FDIRE (excluding CH-HK FDIRE)

	(1)	(2)
MSCI	2.795**	4.054***
	1.31	1.36
CTRY	1.203***	1.182***
	0.06	0.06
RERES	0.641***	0.651***
	0.05	0.05
FXRES	-2.638	-4.944**
	2.24	2.29
FXCOM	0.388	1.590
	1.65	1.67
UIN	0.894***	0.802**
	0.34	0.33
L.Log of FDIRE	0.133	0.0259
	0.14	0.12
Log of GDP	5.222***	6.797***
	1.71	1.98
Country governance	3.619	-0.502
	5.51	5.58
DE ratio	-0.00140	0.000410
	0.00	0.00
log firm size	0.492***	5.062***
	0.16	0.62
REIT status	0.987***	
	0.31	
Constant	-152.5***	-223.8***
	45.52	52.88
Firm Fixed Effects	No	Yes
Time Fixed Effects	Yes	Yes
Country Fixed Effects	Yes	No
Firm clusters	169	169
Adjusted R-Square	0.461	0.471
F	105.6	122.6
N	5482	5482

*This table presents the results of the dependent variable, quarterly excess firm returns, regressed on the lagged (by one trimester) variable of World FDIRE (excluding CH-HK FDIRE). We control for the macroeconomic and firm-level variables. Columns (1) present the regression results using Time and Country fixed effects. Columns (2) present the regression results using Time and Firm fixed effects. This regression excludes Australia due to non-access to data. **MSCI** is the quarterly total return on the MSCI world stock market index. **CTRY** is the residual country factor. **RERES** is the residual country real estate factor. **FXRES** and **FXCOM** represent residual and common currency factors. **UIN** is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). **L.Log of FDIRE** is the lagged log of World (excluding CH-HK) quarterly outward real estate investment in the respective country collected from Real Capital Analytics. **Log of GDP** is the quarterly log value of GDP of the relevant country. **Country governance** is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. **DE ratio** is the debt-to-equity ratio. **log firm size** is the log of the market value of the firm. **REIT status** is a dummy variable that takes the value of one if the firm has adopted the REIT status. Standard Errors are clustered at the firm level.*

**** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.*

Table C3 – Regression results using US FDIRE

	Full-sample countries		Asia sample countries	
	(1)	(2)	(1)	(2)
MSCI	1.026	2.479**	2.405*	3.583**
	1.17	1.21	1.40	1.44
CTRY	1.155***	1.139***	1.195***	1.178***
	0.06	0.06	0.06	0.06
RERES	0.619***	0.620***	0.646***	0.657***
	0.05	0.05	0.05	0.05
FXRES	-4.415**	-5.999***	-4.043*	-6.108***
	1.98	1.98	2.25	2.29
FXCOM	-1.060	0.323	-0.100	1.016
	1.47	1.50	1.77	1.80
UIN	0.826**	0.769**	0.908***	0.825**
	0.33	0.33	0.34	0.34
L.Log of FDIRE	-0.0448	-0.0399	-0.0947***	-0.0887**
	0.03	0.03	0.03	0.03
Log of GDP	6.537***	8.283***	5.544***	6.869***
	1.62	1.86	1.70	1.95
Country governance	0.175	-2.724	5.255	0.331
	4.06	4.25	5.51	5.44
DE ratio	-0.000908	0.000616	-0.00139	0.000435
	0.00	0.00	0.00	0.00
log firm size	0.377**	4.823***	0.495***	5.046***
	0.19	0.57	0.16	0.62
REIT status	0.826***		0.978***	
	0.27		0.31	
Constant	-175.0***	-252.0***	-154.8***	-222.9***
	44.84	49.74	45.51	52.66
Firm Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	No
Firm clusters	207	207	169	169
Adjusted R-Square	0.466	0.477	0.462	0.472
F	101.7	125.8	103.7	122.2
N	6541	6541	5482	5482

*This table presents the results of the dependent variable, quarterly excess firm returns, regressed on the lagged (by one trimester) variable US FDIRE. We control for the macroeconomic and firm-level variables. Columns (1) present the regression results using Time and Country fixed effects. Columns (2) present the regression results using Time and Firm fixed effects. Full-sample countries includes Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India and Philippines. In Asia sample countries, we exclude Australia. MSCI is the quarterly total return on the MSCI world stock market index. CTRY is the residual country factor. RERES is the residual country real estate factor. FXRES and FXCOM represent residual and common currency factors. UIN is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). L.Log of FDIRE is the lagged log of US quarterly outward real estate investment in the respective country collected from Real Capital Analytics. Log of GDP is the quarterly log value of GDP of the relevant country. Country governance is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. DE ratio is the debt-to-equity ratio. log firm size is the log of the market value of the firm. REIT status is a dummy variable that takes the value of one if the firm has adopted the REIT level. Standard Errors are clustered at the firm level. *** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.*

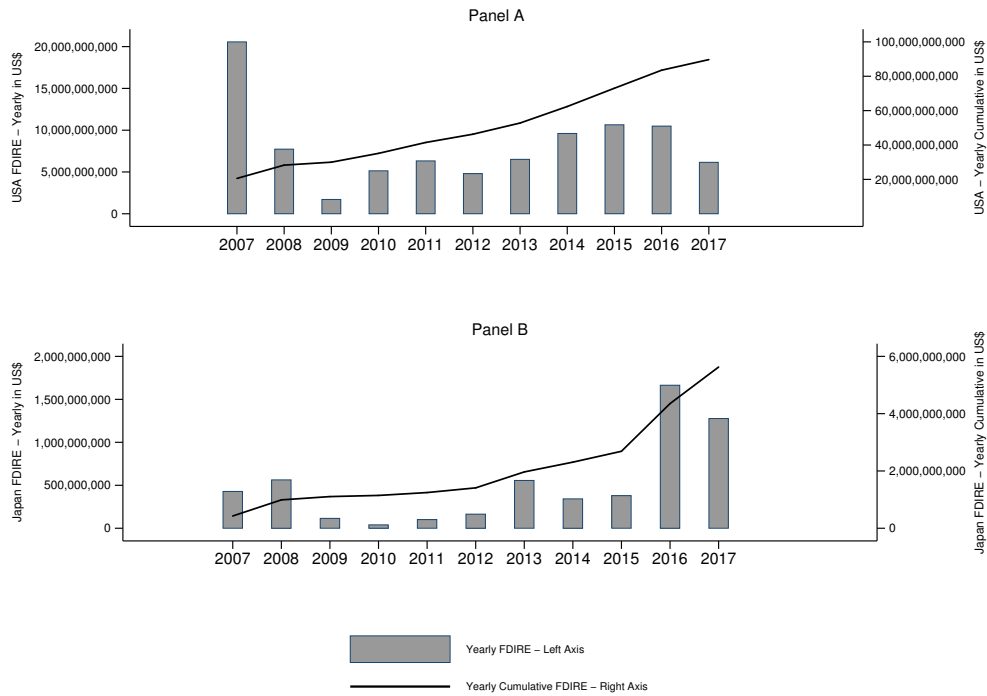
Table C4 – Regression results using Japan FDIRE

	Full-sample countries - excluding Japan		Asia sample countries - excluding Japan	
	(1)	(2)	(1)	(2)
MSCI	-0.191	1.382	2.655	3.433
	1.65	1.69	2.24	2.28
CTRY	1.398***	1.400***	1.493***	1.494***
	0.08	0.08	0.09	0.09
RERES	0.538***	0.534***	0.459***	0.484***
	0.06	0.06	0.07	0.07
FXRES	-5.703*	-7.438**	-5.986	-7.205*
	3.17	3.18	4.24	4.31
FXCOM	-1.247	0.278	1.266	2.024
	1.92	1.99	2.84	2.90
UIN	1.265***	1.351***	1.381***	1.367***
	0.47	0.45	0.50	0.47
L.Log of FDIRE	0.0242	0.0218	0.0676	0.0541
	0.03	0.03	0.05	0.05
Log of GDP	8.306*	9.911**	12.56**	9.552
	4.54	4.56	6.15	6.31
Country governance	-4.327	-6.962	1.207	-1.982
	7.83	7.27	8.33	7.85
DE ratio	-0.000153	0.000188	-0.000520	0.000241
	0.00	0.00	0.00	0.00
log firm size	0.689***	5.783***	0.710***	6.633***
	0.24	0.72	0.24	1.04
REIT status	0.372		0.587	
	0.36		0.42	
Constant	-210.7*	-283.9**	-345.1**	-289.9*
	114.02	115.26	168.46	159.85
Firm Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	No
Firm clusters	152	152	114	114
Adjusted R-Square	0.431	0.446	0.422	0.436
F	81.03	105.9	74.40	85.94
N	3833	3833	2973	2973

This table presents the results of the dependent variable, quarterly excess firm returns, regressed on the lagged (by one trimester) variable Japan FDIRE. We control for the macroeconomic and firm-level variables. Columns (1) present the regression results using Time and Country fixed effects. Columns (2) present the regression results using Time and Firm fixed effects. **Full-sample countries - excluding Japan** includes Australia, Singapore, Malaysia, Indonesia, Thailand, India and Philippines. In **Asia sample countries - excluding Japan**, we exclude Australia. **MSCI** is the quarterly total return on the MSCI world stock market index. **CTRY** is the residual country factor. **RERES** is the residual country real estate factor. **FXRES** and **FXCOM** represent residual and common currency factors. **UIN** is the unexpected inflation collected from filtering the quarterly change of the Consumer Price Index using ARIMA (0,1,1). **L.Log of FDIRE** is the lagged log of Japan quarterly outward real estate investment in the respective country collected from Real Capital Analytics. **Log of GDP** is the quarterly log value of GDP of the relevant country. **Country governance** is the equally weighted average of six governance indicators provided by the Worldwide Governance Indicators. **DE ratio** is the debt-to-equity ratio. **log firm size** is the log of the market value of the firm. **REIT status** is a dummy variable that takes the value of one if the firm has adopted the REIT status. Standard Errors are clustered at the firm level.

*** significance at the 0.01 level ** significance at the 0.05 level * significance at the 0.1 level.

Figure C1 – US and Japan FDIRE in our sample countries



Panel (A) of this figure plots the yearly US FDIRE (left axis) and yearly cumulative US FDIRE (right axis) in the full-sample countries (Australia, Japan, Singapore, Malaysia, Indonesia, Thailand, India, and Philippines). Panel (B) shows the yearly Japan FDIRE (left axis) and yearly cumulative Japan FDIRE (right axis) in the full-sample countries (excluding Japan). Source: Real Capital Analytics.

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RÉSUMÉ

Cette thèse porte sur le secteur des sociétés foncières cotées sur les marchés financiers dont la capitalisation boursière est équivalente à 4.3% du PIB mondial. Le premier chapitre analyse le phénomène du « biais domestique » qui continue à constituer une énigme pour les chercheurs. Les investisseurs ont tendance à investir davantage dans leur propre pays et moins à l'international que la théorie de l'investissement ne le prédit. Les résultats du premier chapitre apportent une explication à ce comportement d'investissement. En utilisant un échantillon de sociétés foncières cotées aux États-Unis, les résultats indiquent que les opportunités de croissance dont disposent les sociétés foncières constituent un des principaux motifs qui poussent les foncières à se concentrer géographiquement dans une ou plusieurs zones géographiques. Le deuxième chapitre s'intéresse aux implications de ces « biais de localisation » en Europe. Ces biais peuvent affecter les décisions de placement des investisseurs institutionnels et peuvent par conséquent générer des surinvestissements dans certaines zones géographiques, qui sont généralement considérées comme offrant le meilleur rendement ajusté au risque. Les résultats confirment que les stratégies d'investissement adoptées par certaines foncières cotées contribuent à accélérer les processus de métropolisation dans dix pays européens. Enfin, le troisième chapitre étudie l'effet des investissements directs étrangers sur les sociétés foncières cotées dans huit pays de l'Asie-Pacifique. Les résultats montrent que seule la Chine exerce un impact puissant sur les rendements des foncières dans la région.

MOTS CLÉS

Sociétés d'investissement immobilier cotées, Concentration géographique, Options de croissance, Financiarisation, Investissements directs étrangers, Risques macroéconomiques

ABSTRACT

This thesis focuses on the listed real estate sector whose market capitalization is equivalent to 4.3% of global GDP. The first chapter analyzes "the home bias puzzle" which continues to be an enigma for researchers. Investors invest more in their own countries and less so internationally than investment theory would predict. The results of the first chapter provide an explanation for this investment behavior. Using a sample of US listed real estate companies, the results indicate that the company's decision to concentrate its business in one or several geographic areas is mainly motivated by the level of growth opportunities available to this company. The second chapter looks at the implications of these "location biases" in Europe. These biases can affect the investment decisions of institutional investors and might therefore generate over-investments in certain geographical areas, which are generally believed to provide the highest risk-adjusted expected returns. The results of the second chapter confirm that the investment strategies adopted by some listed real estate companies contribute to the acceleration of the metropolization processes encountered in ten European countries. Finally, the third chapter examines the effect of foreign direct investments on listed real estate companies' returns in eight Asia-Pacific countries. The results show that only China has a potent impact on these returns.

KEYWORDS

Real estate investment trusts, Geographic concentration, Growth options, Financialization, Foreign direct investments, Macroeconomic risks