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Insights into a Predominant and Dynamic Informal Sector : the Case of Vietnam

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Insights into a Predominant and Dynamic Informal Sector:
the Case of Vietnam

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UNIVERSITÉ PARIS DAUPHINE
ÉCOLE DOCTORALE DE DAUPHINE

**Insights into a Predominant and Dynamic Informal Sector:
the Case of Vietnam**

THESE

pour l'obtention du titre de Docteur en Sciences Économiques

Axel DEMENET

Jury

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Một lời cảm ơn em thật không bao giờ đủ cả. Em không phải là người giúp anh làm luận văn tiến sĩ mà em chính là nguồn gốc của cái luận văn này. Anh không biết khoa học có biết ơn em không, nhưng mà anh thì có.

To Linh, Ma Be Den, and the countless others.

Abstract

This PhD dissertation is built around four main chapters. They handle questions about the informal sector that shall sound familiar to policy makers, and to all empirical economists working on microenterprises. They are indeed based on policy recommendations that could be summarized in the three following mottos: “formalize them”, “protect them”, and “train them”. Little of these recommendations rely on actual evidence of their effects on the firms themselves. The originality of this work lies in that it does ask these questions from the perspective of the micro-firms. The first chapter questions the relevance of formalization: what exactly do these production units have to gain from registration? The second chapter investigates the vulnerability of microenterprises to health problems: how much do they suffer from the consequences of health shocks in the household? The third chapter deals with the complementary question of the protection mechanisms, and questions the mitigating power of health insurance. The fourth chapter deals with their managerial capital: do the business skills that are considered standard among larger firms have any meaning for the productivity of informal micro enterprises?

Résumé

Le terme de *secteur informel* désigne l'ensemble des micro-entreprises domestiques échappant plus ou moins à la régulation publique. Il représente dans les pays en développement une part importante –voire dominante– des emplois. C'est le cas au Vietnam, où son poids reste relativement stable malgré une croissance économique rapide et une forte réduction du taux de pauvreté. La compréhension des dynamiques micro-économiques de ce secteur très hétérogène est primordiale pour informer les politiques publiques. Les quatre chapitres de ce travail posent quatre questions fondamentales de ce point de vue : quels bénéfices peut-on attendre de la formalisation de ces micro-entreprises (chapitre 1)? Dans quelle mesure ces unités de production, dont le budget est souvent confondu avec celui du ménage, sont-elles vulnérables aux chocs de santé qui occasionnent des dépenses élevées et non-anticipées (chapitre 2)? L'assurance santé permet-elle de réduire efficacement cette vulnérabilité (chapitre 3)? Enfin, quelle est l'importance du mode de gestion pour la productivité de ces micro-entreprises (chapitre 4)? Tous les chapitres s'appuient en premier lieu sur des données d'enquêtes quantitatives, de première ou seconde main, et en deuxième lieu sur des enquêtes qualitatives. Les résultats dressent le portrait d'un secteur dynamique et suggèrent des politiques pour améliorer la productivité de ces entreprises opérant dans des conditions largement précaires.

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Résumé

Le terme de *secteur informel* désigne l'ensemble des micro-entreprises domestiques échappant à la régulation publique. Ce secteur représente dans les pays en développement une part importante – voire dominante – des emplois. L'urbanisation rapide, l'absence de protection sociale qui force à générer un revenu de subsistance et le manque de capital social et humain sont autant de facteurs structurels qui expliquent son importance et sa persistance. C'est le cas au Vietnam, où malgré une croissance économique rapide et une forte réduction du taux de pauvreté au cours des dernières décennies, le poids du secteur informel reste relativement stable.

La compréhension des dynamiques micro-économiques de ce secteur très hétérogène est primordiale pour informer les politiques publiques. Les quatre chapitres de ce travail posent quatre questions fondamentales de ce point de vue : quels bénéfices peut-on attendre de la formalisation de ces entreprises (chapitre 1)? Dans quelle mesure ces unités de production, dont le budget est souvent confondu avec celui du ménage, sont-elles vulnérables aux chocs de santé qui occasionnent des dépenses élevées et non-anticipées (chapitre 2)? L'assurance santé permet-elle de réduire efficacement cette vulnérabilité (chapitre 3)? Enfin, quelle est l'importance du mode de gestion pour la productivité de ces micro-entreprises (chapitre 4)?

L'originalité de l'approche est de poser ces questions du point de vue des entreprises informelles elles-mêmes. Tous les chapitres s'appuient en premier lieu sur des données d'enquêtes quantitatives, de première ou seconde main. Ils utilisent également des résultats d'enquêtes qualitatives : j'ai passé dans le cadre de cette thèse près de trois années au Vietnam, en accueil à l'École Française d'Extrême-Orient et à l'université d'Économie de Ho-Chi-Minh Ville. Les résultats dressent le portrait d'un secteur dynamique d'entreprises opérant dans des conditions largement précaires, et permettent d'identifier des politiques publiques efficaces pour améliorer leur productivité.

Résumé des chapitres

Chapitre 1: mesurer l'impact de la formalisation des entreprises domestiques

Ce premier chapitre aborde deux questions fondamentales sur le secteur informel, pertinentes pour informer les politiques économiques d'un grand nombre de pays en développement : est-ce que les micro-entreprises informelles gagnent à rejoindre le secteur formel? Si oui, par quels mécanismes? S'il est généralement admis qu'à long terme le développement économique est synonyme de formalisation à grande échelle et si les politiques d'encouragement à la formalisation sont parmi les plus recommandées, les effets de la formalisation du point de vue des micro-entreprises existantes restent en effet très mal connus.

Ce chapitre utilise principalement les données de panel de première main issues des vagues 2007 et 2009 de l'enquête Secteur Informel (HB&ISS). Il s'appuie également sur des enquêtes qualitatives conduites à Ho Chi Minh Ville en avril 2013, ainsi qu'en 2009 à Hanoi. Un premier résultat descriptif est que les micro-entreprises qui rejoignent le secteur formel constituent une population spécifique, dont les caractéristiques moyennes sont significativement différentes du reste du secteur informel. Ceci vient appuyer l'idée selon laquelle toutes les micro-entreprises du secteur informel n'ont pas vocation à se formaliser. Beaucoup sont des activités de subsistance, ayant vocation à générer un revenu pour un individu ou un foyer plutôt qu'à gagner en taille. Pour d'autres segments de cette population en revanche, la question de la formalisation mérite d'être posée.

Un second résultat est que la formalisation permet aux micro-entreprises d'améliorer leurs conditions d'exercice. En combinant les méthodes de différence-en-différence et d'appariement, nous montrons que l'enregistrement facilite l'accès à l'équipement destiné à la production (électricité et internet). De plus, les micro-entreprises opèrent à une plus grande échelle : leur taille moyenne augmente, de même que leur probabilité d'accéder à des locaux couverts (par opposition à l'exercice ambulatoire) et de tenir une comptabilité écrite. De plus, il apparaît que les micro-entreprises formalisées opèrent dans un environnement perçu comme plus compétitif. Dans l'ensemble, les unités de production deviennent plus efficaces lorsqu'elles s'affranchissent des nombreuses contraintes associées à l'informalité et au flou juridique.

Enfin, le troisième résultat principal est que cette possibilité d'opérer à une échelle plus grande et d'accéder à de meilleurs équipements se traduit par de meilleures performances. Nous estimons

que l'impact de la formalisation sur la valeur ajoutée moyenne (en niveau annuel) est de 20% -et de 17% en utilisant les profits nets.

L'apport majeur de ce chapitre est de mettre en évidence les mécanismes par lesquels la formalisation améliore les performances des micro-entreprises informelles. Un autre apport important est de montrer que cet effet est hautement hétérogène selon le segment considéré. En effet, les travailleurs pour compte propre (c'est à dire les micro-entreprises constituées d'un seul travailleur, n'ayant aucun employé) n'ont rien à gagner à rejoindre le secteur formel. En moyenne, ni leurs conditions d'opération, ni leurs performances ne sont significativement améliorées. Il est probable qu'un certain seuil de taille soit nécessaire pour bénéficier en tant qu'entreprise d'une existence légale et d'un meilleur accès aux biens et services publics.

Ces résultats ont d'importantes implications de politiques publiques. Il est important de reconnaître que toutes les micro-entreprises informelles n'ont pas vocation à devenir formelles. Les plus précaires, dont la justification est principalement de fournir un revenu de subsistance, ne vont probablement pas de formaliser d'elles-mêmes, et ce même en présence d'incitations fortes. Les campagnes coercitives n'auront, au mieux, aucun effet de leur point de vue. Les individus qui constituent ce segment précaire ne doivent cependant pas être privés de toute reconnaissance politique et de tout soutien public. L'attitude des autorités semble être à l'opposé dans le Vietnam contemporain : une loi votée en 2008 interdit la vente ambulante dans un grand nombre de quartiers, ce qui dénote une volonté commune parmi de nombreuses villes en développement de privilégier les signes de modernité au détriment des travailleurs du secteur informel.

Chapitre 2: la vulnérabilité des micro-entreprises domestiques aux chocs de santé

La motivation de ce travail trouve son origine dans une observation de terrain récurrente: au Vietnam, les problèmes de santé sont extrêmement coûteux. Ils se traduisent par des dépenses tellement élevées (en soin ainsi qu'en frais indirects) qu'il semblait impossible pour les micro-entreprises domestiques, opérant en général avec un ou deux travailleurs et un capital très faible, d'être imperméables à leurs conséquences. Cette intuition est confirmée par les résultats de ce second chapitre, qui analyse de façon systématique la vulnérabilité des micro-entreprises aux chocs de santé -définis comme des problèmes de santé graves et inattendus au sein du ménage.

La littérature est abondante sur le risque pour les ménages à faible revenus de tomber dans la pauvreté à la suite de chocs de santé. Elle pointe les effets de ces chocs sur la consommation, et pour partie sur les activités agricoles et salariées. Pourtant, aucun article ne mentionne les effets que ces chocs peuvent avoir sur l'activité qui permet à la majorité des travailleurs non-agricoles de générer un revenu: les micro-entreprises. On peut, à partir des résultats existants, émettre une hypothèse sur les deux canaux par l'intermédiaire desquels les chocs de santé peuvent avoir une influence directe sur les micro-entreprises : le temps et l'argent. En effet, les chocs de santé sont à la fois coûteux en dépenses directes et indirectes liées aux soins, et en temps passé dans l'impossibilité de travailler. Ces deux types de coûts sont partagés au sein du ménage : les membres d'une même famille sont solidaires des dépenses, en particulier des dépenses les plus élevées, si bien qu'un problème grave affectant l'un des membres sera ressenti sur le budget de l'ensemble du ménage. L'analyse consiste donc à séparer ces deux canaux potentiels, tout en considérant les problèmes de santé de l'ensemble du ménage plutôt que de l'individu lui-même.

Afin d'obtenir des informations simultanément sur les micro-entreprises domestiques et sur la santé des individus qui y travaillent (ainsi que sur celle des autres membres du même ménage), ce chapitre utilise une enquête nationale sur les conditions de vies des ménages (VHLSS). Il s'agit de données de seconde main, représentatives au niveau national, à partir desquelles je construis un panel d'entreprises. En utilisant les vagues de 2006 et 2008, il est possible de relier le module relatif à l'entreprise domestique à la personne du ménage qui en a la charge. En fusionnant ces informations avec le module de santé, qui concerne l'ensemble des membres du ménage, il est possible d'associer à chaque micro-entreprise un ensemble complet d'informations sur les problèmes et les dépenses de santé de l'ensemble du ménage auquel cette entreprise appartient.

Les chocs de santé, même en restreignant autant que possible aux événements nouveaux et inattendus, ne sont toutefois pas exogènes. L'identification repose ainsi sur la combinaison

d'effets fixes et de variables de contrôle mesurant des éléments variables dans le temps. Les résultats montrent que les chocs de santé, qu'ils affectent le chef de la micro-entreprise ou bien un autre membre de son ménage, ont un effet causal direct et important sur la micro-entreprise elle-même. Un autre résultat majeur consiste à montrer que le principal mécanisme en jeu est le coût monétaire. En effet, les ménages modestes ont un budget contraint. Il y a une grande porosité entre les budgets de l'entreprise domestique et du ménage ; lorsqu'un choc de santé au niveau du ménage génère des dépenses importantes, les ménages substituent les dépenses de santé à celles prévues pour l'entreprise. Il existe donc un effet d'éviction important, dont j'estime la magnitude à 0.5 : en moyenne, pour chaque unité monétaire dépensée dans la santé lors de chocs importants, le budget de l'entreprise domestique sera diminué d'une moitié de cette unité. En revanche, les coûts en temps n'ont pas d'influence significative sur les micro-entreprises. Ils peuvent être, plus que les coûts, financiers, récupérables lors de la reprise d'activité. Une autre possibilité est la substitution de travailleurs non affectés au sein du ménage.

Ce chapitre démontre que les montants de dépense de santé auxquels les ménages doivent faire face en cas de choc sont disproportionnés par rapport à ce que leur entreprise domestique leur permet de générer. L'investissement est également affecté, ce qui laisse entrevoir des conséquences de long terme : c'est la capacité de croissance de ces micro-entreprises qui est menacée en cas de choc de santé au sein du ménage. Ces résultats suggèrent qu'au niveau macro-économique, le coût des chocs de santé est bien plus élevé que la somme des dépenses contemporaines : la perte de revenu *non généré* par les micro-entreprises, qui en souffrent directement, représente un important coût d'opportunité.

Les politiques de financement des systèmes de santé plaçant un poids important sur les dépenses directes des ménages ont été largement encouragées dans les pays en développement depuis la fin des années 80, et en particulier au Vietnam où le système public a longtemps été structurellement sous-financé. En promouvant les frais directs et en encourageant l'émergence des acteurs privés, le coût direct des soins a fortement augmenté, ce qui a probablement eu des conséquences économiques néfastes au vu des résultats de ce chapitre.

Chapitre 3: L'assurance santé peut-elle réduire la vulnérabilité des micro-entreprises domestiques ?

Les travailleurs du secteur informel sont, dans leur immense majorité, peu couverts par les systèmes de protection sociale. Ils bénéficient parfois de l'extension de couverture liée à l'assurance couvrant un autre membre du ménage, ou bien de la prolongation de la couverture liée à un emploi précédent ; cependant, leur couverture par ces systèmes contributifs destinés aux travailleurs formels est marginale. Il est en revanche plus courant, en particulier du point de vue de l'assurance santé qui est l'objet de ce chapitre, qu'ils soient couverts gratuitement par leur inclusion dans des systèmes d'assistance sociale (si par exemple leur ménage est classifié comme pauvre, et aidé à ce titre). Ces programmes sont destinés aux ménages vulnérables, classifiés sur la base de leur revenu, de leur lieu d'habitation et/ou de leur appartenance ethnique. Mais beaucoup de pays, dont le Vietnam, font face à un problème de « milieu manquant » : les ménages qui ne sont pas assez pauvres pour bénéficier de l'assistance sociale, mais pas assez riches pour être couverts par les systèmes contributifs ou volontaires, sont les moins protégés.

Prenant en considération la grande vulnérabilité des micro-entreprises domestiques aux conséquences financières des chocs de santé au sein du ménage mise en évidence dans le chapitre deux, il est naturel d'attendre de l'assurance santé un certain degré de protection –et donc de réduction de cette vulnérabilité. En tant que mécanisme d'agrégation des risques, l'assurance santé devrait théoriquement protéger les individus, et indirectement les micro-entreprises.

L'objectif premier de ce chapitre est d'analyser empiriquement les effets de l'assurance santé des ménages sur les micro-entreprises domestiques. J'analyse la relation entre le degré de couverture d'un côté, et de l'autre le revenu de l'entreprise, le nombre de jours travaillés et l'investissement. En effet, au vu des résultats du chapitre précédent, on doit s'attendre à ce que les entreprises appartenant à des ménages mieux assurés soient en moyenne à même de générer plus de revenu, de travailler plus longtemps, et d'investir plus.

Il faut pour ce faire surmonter l'endogénéité du statut assurantiel, qui est supposée donner lieu à une auto-sélection (les individus les plus à risque sont les plus incités à s'assurer). Une méthode d'identification efficace est fournie par une variation exogène de la couverture d'assurance santé, liée à un changement réglementaire.

En mars 2005, un décret gouvernemental donne accès à tous les enfants de moins de six ans à une assurance santé totale et gratuite. Cette réforme introduit une discontinuité dans la

couverture santé des enfants : ceux qui ont moins de six ans se voient couverts de façon exogène, alors que ceux qui ont 6 ans et plus restent très imparfaitement couverts (à moins de 63%). Cette discontinuité reste cependant imparfaite. Parmi les micro-entreprises, en revenant à la firme comme unité d'observation, cette réforme a introduit une discontinuité dans la *proportion d'enfants couverts au sein du ménage auquel l'entreprise appartient*. L'âge du plus jeune enfant du ménage, puisqu'étant la variable d'allocation, peut alors être utilisé comme instrument local pour expliquer la proportion d'enfants couverts dans le ménage. Cette proportion, puisque les enfants représentent un poste majeur de dépenses de santé du ménage, est en lien avec l'activité de l'entreprise domestique que l'on sait poreuse à cette dépense.

Les résultats de ce chapitre montrent que l'augmentation du taux de couverture suivant la réforme de 2005 n'a pas été à même de réduire la vulnérabilité des micro-entreprises. En effet, le taux de couverture n'a aucun impact significatif sur les dépenses de santé totales, ni sur le nombre de jours travaillés. En revanche, un effet positif temporaire apparaît sur l'investissement. J'interprète ceci, à la lumière d'autres travaux récents, comme un « effet de tranquillité » : quand bien même les dépenses ne sont pas réellement affectées par l'assurance, les ménages perçoivent l'environnement comme moins risqués –ce qui encourage temporairement à investir. L'absence d'effet sur la vulnérabilité résulte en fait du très faible degré de protection financière qui est associé à l'assurance au Vietnam, qui semble être encore vrai aujourd'hui.

Chapitre 4: le mode de gestion explique-t-il les variations de productivité des micro-entreprises?

Peu questionneront la pertinence de dépenses de marketing dans le cas d'une entreprise industrielle multinationale. Dans le cas d'un travailleur du secteur informel fabriquant des sandales en plastique, on peut en revanche s'attendre à un plus haut degré d'incrédulité. La motivation de ce chapitre est précisément de poser cette question d'une façon comparative : est-ce que le capital managérial d'une firme compte dans le cas des micro-entreprises autant que dans celui des petites et moyennes entreprises ? La question émerge dans la littérature récente : puisque la compréhension des barrières à la croissance de la productivité est au premier plan, les mécanismes de gestion commencent à être considérés comme l'un des facteurs. Plusieurs autres contraintes pesant sur le développement des micro-entreprises ont déjà été avancées. L'accès à l'épargne, au crédit, et le manque de capital humain sont parmi les mieux documentés. Le manque de capital managérial, en revanche, n'a été suggéré que récemment.

La notion de capital managérial n'a pas à ce stade de frontière précise, et emprunte à plusieurs domaines disciplinaires ayant des définitions complémentaires. Dans la littérature en économie du développement, le capital managérial est mesuré par les pratiques de gestion (et parmi les micro-entreprises, par les pratiques élémentaires). Dans la littérature en management, qui a longtemps analysé le rôle du gestionnaire, on met de plus en avant dans le cas des micro-entreprises les *attitudes* de leur gérant, qui peut dénoter une plus ou moins grande orientation entrepreneuriale. L'ensemble de la littérature empirique dans les deux disciplines peine cependant à démontrer un lien solide. D'un côté, les recherches en économie du développement reposent sur une accumulation d'évaluations de programmes de formation qui améliorent de façon aléatoire les capacités de gestion dont les résultats sont très nuancés. D'un autre côté, une littérature empirique a émergé dans le domaine de l'orientation entrepreneuriale des micro-entreprises dans les pays en développement, mais souffre de nombreuses limitations méthodologiques. Dans ce cadre, il est nécessaire de s'appuyer sur des données d'enquêtes pour montrer un lien d'ensemble entre capital managérial et productivité.

La preuve d'une relation de causalité entre productivité et capital managérial est compliquée par le fait que ce dernier ne varie pas de façon exogène. Il appartient plutôt à l'éternellement inobservé « talent » du gestionnaire, et tout lien avec le niveau de productivité de la firme peut aussi bien être attribué à d'autres facteurs inobservés. L'approche adoptée dans ce chapitre ne consiste donc pas à tenter de démontrer un lien causal à partir des données d'enquêtes. Il s'agit plutôt, à l'aide d'un indicateur synthétique du capital managérial et d'estimations sans biais de la productivité, de comparer l'association entre les deux selon la catégorie de taille des firmes.

Pour ce faire, j'utilise des données de panel sur un échantillon de micro, petites et moyennes entreprises qui incluent un ensemble d'indicateurs du capital managérial. J'en construis un indicateur multidimensionnel basé sur douze variables, dont est extrait un score pondéré. L'estimation repose ensuite sur une approche en deux étapes. Dans un premier temps, j'estime de façon consistante le niveau de productivité par firme en contrôlant par les biais de simultanéité et de prix des intrants. Dans un second temps, j'analyse l'effet du score de capital managérial sur cette productivité par firme, en contrôlant par l'hétérogénéité inobservée.

Le niveau de productivité est fortement et presque linéairement croissant avec la taille de l'entreprise, mesurée en nombre de travailleurs. Les micro-entreprises sont donc, toutes choses égales par ailleurs, moins productives que les petites et moyennes entreprises domestiques. L'analyse en seconde étape teste l'hétérogénéité de l'effet du score de capital managérial par taille. Il en ressort que son effet est significatif, et surtout d'ampleur comparable, selon la taille des

entreprises. Les micro-entreprises qui ont le plus de compétences de gestion sont de fait plus efficaces que celles qui en ont moins – et la différence d'efficacité est aussi importante que parmi les petites et moyennes entreprises. En d'autres termes, même si les compétences de gestion sont nettement plus rares parmi les micro-entreprises que parmi les populations de firmes de plus grande taille, elles expliquent un pourcentage similaire de variation de la productivité. Une variation d'un écart-type du score de capital managérial est associée avec une augmentation significative de 9 à 11% de la productivité.

General Introduction

Microenterprises, Informal Sector, Growth and Development

This PhD dissertation is built around four main chapters. They handle questions about the informal sector that will sound familiar to policy makers, and to all empirical economists working on microenterprises. They are based on policy recommendations that could be summarized in the following three mottos: “*formalize them*” (chapter 1), “*protect them*” (chapters 2 and 3), and “*train them*” (chapter 4). The reason why these recommendations are common is because most of the attention to the informal sector is given through the negative of the photo. Being informal is essentially *not being formal*. Since formal firms in high-income countries are registered, their owners insured against health or unemployment risks, and since they have more or less elaborated business skills, it is assumed that the natural –and assumingly desirable– evolution of the informal sector is to converge towards the characteristics of these formal firms. However, few of these recommendations rely on actual evidence on their effects for the firms themselves. The originality of this work lies in the fact that it asks these questions from the perspective of the micro-firms. Chapter one starts by questioning the relevance of formalization: what exactly do these production units have to gain from registration? Coming “*out of the gray*” (borrowing E. Maleski’s (2009) term) rather than doing business as usual, outside of the legal framework, bears trivial gains for the regulatory power and tax collection capacity of the State. But the benefits from the perspective of the already existing micro firms were less clear. The second chapter investigates the vulnerability of microenterprises to health problems. Being typically made of one –or in the best cases, a few- workers, and their budget being interwoven into the one of the household, how economically vulnerable are these micro-firms to the consequences of health shocks affecting individuals? The third chapter deals with the complementary question of the protection mechanisms, and questions the mitigating power of health insurance. Knowing that

they are highly vulnerable to health shocks, how much financial protection can they expect from the emerging insurance scheme, and under which conditions? The fourth chapter deals with managerial capital. Do the business skills that are considered standard among larger firms, and the teaching of which through training programs increased in the last decade in developing countries, have any meaning for informal micro enterprises?

In the answers provided lie keys to enhance the potential of these microenterprises. Given that most of them generate income for poor or near-poor households, these are also keys to promote “inclusive growth”. But a preliminary requirement to give coherence to these four chapters is to grasp the economic and social importance of this population, and to question the role it can play in the development process. If the latter simply consists in the multiplication of factory jobs, there is not much interest in analysing the informal sector, whose vocation would only be to disappear more or less rapidly as GDP per capita increases. This approach of Development would then amount to asking how fast industrialization will happen as people shift from agricultural to factory jobs. In what anthropologists such as Tania Murray Li (2013) call *The big narrative of the transition*, the household business sector is barely a supporting actor. As if one could expect the 19th century European transition to be reproduced worldwide, a large-scale rural to urban, agricultural to industrial shift is assumed.

It turns out that this view is dominant in Vietnam. Foreign-capital industrial firms (FDI) attract in the media, in academia, and more importantly among policy makers, a degree of attention that is inversely proportional to the number of jobs they represent. In local and international media, the chief interrogation is indeed how fast Vietnam is to become the “*next Asian tiger*”, and what are the remaining obstacles on the unique way towards this rapid growth: more FDI. As put by *The Economist*¹ (07/2016) when the journal pointed the level of foreign direct investment as an indicator of the country’s “*greater economic potential*”, the “*biggest factor in Vietnam’s favour*” is to be “*the obvious substitute for firms moving to lower-cost production hubs*”. In academia, the attention is similarly focused; it is anecdotally telling in this regard to have a look at the contents of the Vietnamese Economists Annual Meeting (VEAM) programs. During the 5 conferences organised between 2012 and 2016, I counted 65 papers on FDI, trade or exports. Conversely, the informal sector –or more broadly micro and small enterprises-, was the object of only 8 papers (including two of my own). The overall impression, as put by the World Bank (2004),² is that “*it is unlikely that nonfarm household enterprises will play a decisive role [...] because their share of the total labor force slowly*

¹ *The Economist*, Good afternoon, Vietnam; Asia’s next tiger. Aug 6th 2016, printed edition.

² Economic Growth, Poverty, and Household Welfare in Vietnam. Regional and sectoral studies, WB, Washington DC, 2004

declined in the 1990s. Their main role is to serve as a temporary source of employment for workers who will eventually find wage work”.

This has to be put in perspective with the reality of the labour market. In 2014, the household business (henceforth, HB) sector still represented nearly 60 per cent of the total number of non-agricultural main jobs (counting both employers and employees), versus less than 4 per cent for FDI firms. As people are squeezed out of agriculture, their access to formal jobs is contingent upon the creation of these jobs. Those excluded from land access and agriculture primarily rely on their own labour to generate income, and naturally swell the ranks of microentrepreneurs. If one takes a different perspective to recognize the persistence of this sector, and eventually its dynamic nature (as stated in the title), a very different picture of the development process can be drawn.

An indispensable first step for this, taken by this introductory chapter, is thus to ask just *how persistent* and *how dynamic* the informal sector really is in Vietnam. The first question involves some time dimension (not to say a historical perspective, which is beyond the reach of a modest quantitative economist). What is the relative importance of the microenterprises sector? How many workers does it include? Does it, as the transition narrative would imply, shrink rapidly with economic growth? The second question calls for an international outlook to put the characteristics of the Vietnamese informal sector into perspective. Is there any specificity of the microenterprises sector in this country, when compared with other low- and middle-income economies?

1. Surge and persistence of the household business and informal sector in Vietnam: a labour market perspective

Vietnam is broadly considered a model country when it comes to poverty reduction and economic growth. The Household Business and Informal Sector (HBIS) played a role in this process, as the following description of the evolution of the labour market will tell. But what exactly is this sector made up of?

Microenterprise, household business, production unit: all these terms are used, sometimes interchangeably, throughout this dissertation to refer to the set of enterprises made of both the “formal household businesses”, and what is called since Keith Hart’s report in 1972 the “informal sector” (still alternatively designated as “subsistence” or “unorganised” sector). The International Conference of Labour Statisticians clarified the vague boundaries of the latter in 1993.³ All enterprises operating on a small scale, at a low level of organisation, and having no proper legal existence were thereby gathered under a common denomination. The distinction between strictly informal and formal household businesses has been operationally defined as being “*not registered under specific forms of national legislation*”, the interpretation of which was left to each country. In the case of Vietnam, the most commonly used is the Business Registration Certificate (đăng ký kinh doanh).

The object of the four following chapters is thus a somehow larger set of microenterprises than the Informal Sector, which comprises not only the informal units strictly speaking, but also the comparable production units that are registered (formal household businesses). From a statistical point of view, the observation units of all the quantitative surveys that are mobilised throughout the chapters are thus *Household Unincorporated Enterprises for Market*. This definition includes all economic activities that are destined to markets, are not corporate companies, and are not related to the agricultural sector. They are typically small businesses, operated by an employer or own account worker as a main or a secondary activity; they may or may not be registered (which also enables us to compare the impact of the legal status, as done in the first chapter). References are sometimes made, perhaps abusively, to the *informal sector* as a whole even when the “*household business and informal sector*” should be the right term. What matters is that the population of interest indeed captures the whole set of non-farm microenterprises.

³ “the informal sector [consists] of units engaged in the production of goods and services with the primary objective of generating employment and incomes”, having “the characteristic features of household enterprises”, and without “the deliberate intention of evading the payment of taxes or infringing the regulation” (ICLS, 1993).

Box 1. A common observation unit.

1. All chapters deal with the same observation unit: *Household Unincorporated Enterprises for Market*.
2. These units are referred to as *microenterprises*, *household businesses*, *production units*, or sometimes *firms*. They can be formal or informal, depending on their registration status.
3. Taken together, formal and informal household businesses (HB) form the *Household Business and Informal Sector*, referred to as “HBIS” sector.

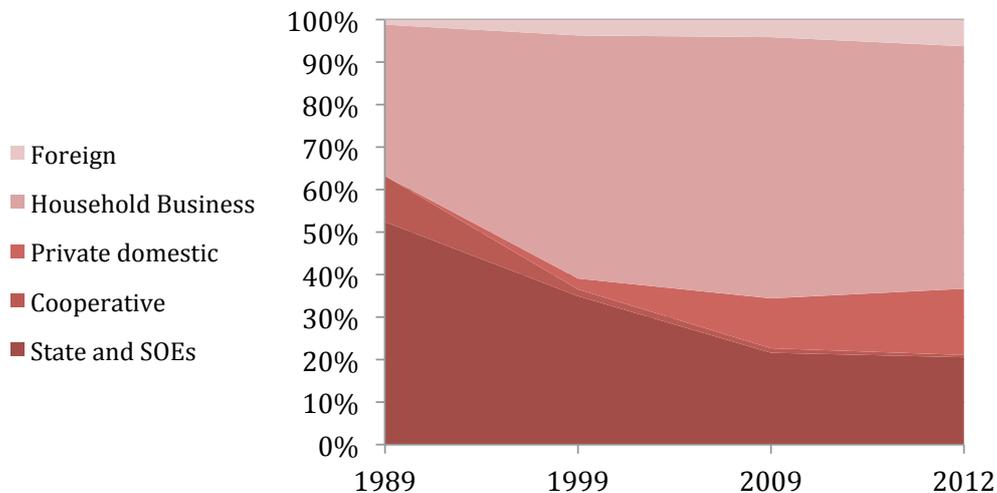
How important are these microenterprises in Vietnam since the transition from the centralised economy? Characterising the economic achievements that followed the transition requires, at first glance, not more than a quick look at GDP per capita figures. Starting from less than 97 current US\$ in 1989, it was multiplied by 4.5 by the year 2000, and reached US\$2,110 by 2015. The country reached the “lower middle income” status in the World Bank’s classification, and is forecasted to become part of the “upper middle income” by 2035. Three decades of war and the heaviest bombings by the US had yet left Vietnam in a state of physical ruin in 1975.⁴ The destructions of wars were followed by an embargo imposed by the “losing” side (lifted in 1994 for trade, and in 2016 for the military part), and by pressure on international bodies to deny aid (the World Bank resumed its operations in 1993 only). A highly centralised system followed the country’s reunification in 75, and lasted until 1986. The economy remained one of the world’s poorest until the second half of the 80s, when the so-called “official renovation” (chính sách đổi mới) was decided at the 6th national congress of the Communist Party. Sounding the shift towards a “socialist oriented market economy”, and towards the reintegration in the world’s economy, it initiated the rapid GDP growth that averaged at 5.5 per cent and 6.4 per cent a year in the 90s and 2000s respectively. While development should not be reduced to simple percentages of output growth since political or environmental considerations are, at the very least, equally important, the country indisputably came a long way.

The labour market perspective on Vietnam’s success story is informative about the underlying mechanisms of the transition, as it lets us grasp the importance of each sector in terms of jobs creation. A first stylised fact that supports the classical transition view is the decline of agriculture. Farm employment shrinks continuously in relative terms, and accounts year after year

⁴ Estimations of the number of deaths for the period 1954-1975 (for the US war only) by R.J. Rummel range between 1.5 and 3.6 million, of which both the absolute numbers and the width of the confidence interval are telling.

for a lesser percentage of the total number of jobs. Absolute figures are also telling; the increment of farm jobs still verged on 500 thousand per year between 1990 and 1995, but since 1999 more leave agriculture than enter it. On the whole 1989 and 2012 period, Oudin, *et al.* (2014) provide a comprehensive analysis, by combining data from the recent labour force surveys with older censuses and surveys of the General Statistics Office. Figure 1 below, reproduced with the author's permission, summarises the profound changes undergone by the non-farm labour market. A similar analysis is provided by Cling, Razafindrakoto & Roubaud (2014). It shows the percentage that each institutional sector represents in the total number of main jobs. The main message, and second stylised fact for this period, is that the bulk of jobs created during the 90s were in the HBIS sector. Whereas people started a business, or went to work in the family (or another) HB, the newly created main jobs were overwhelmingly in micro and small enterprises. In the years immediately following the *đổi mới*, employment was still predominantly in the public sector. The large State-Owned Enterprises (SoE) remained at the centre of the production system, but private entrepreneurship rapidly expanded. By 2000 the HBIS sector was already predominant, accounting for nearly 60 per cent of total employment.

Figure 1. Repartition of the labour force by institutional sector, 1989-2012.



Source: Oudin *et al.*, 2014.

The third stylised fact about the post-reform Vietnamese labour market visible in figure 1 is the regression, rather than the collapse, of employment in SoEs. After a strong and almost linear decrease during two decades after 1989, the percentage of jobs in the public sector remained stable around 20 per cent. Fourthly, the emergence of the domestic private sector since the early 2000s is apparent, as its share in employment started to increase; by contrast, employment in foreign capital firms remained marginal.

The structural evolution of the labour market in this period of rapid growth thus amounted to a strong decline of farm and public jobs. The bulk of employment rapidly switched to the HBIS sector, which became (and remained) predominant even though private enterprises emerged. In other words, the source of income of the majority of non-agricultural workers in Vietnam during the last three decades was the profits generated by their microenterprises. The emergence, predominance and persistence of the HBIS sector are correlates of Vietnam's success story. Additional insight on its importance in recent years, where the growth rate remained high, is given in figure 2. I compiled the Labour Force Surveys data since 2007,⁵ before and after the country reached the per capita threshold of the lower middle-income category. Classifying jobs by status as well as institutional sector (self-employed workers in the HB sector; employee in HB; public and private employment) provides a synthetic view of their relative importance. To the main question of whether the HBIS sector that emerged during the transition rapidly shrinks with persistently high growth, the short answer is no.

Figure 2. Repartition of the labour force by status and institutional sector, 2007-2014.



Source: author's calculations, Labour Force Surveys, GSO. "Private sector" includes employment in corporate enterprises.

Even while GDP per capita more than doubled between 2007 and 2014 (from US\$919 to US\$2050), the HB sector weight in the number of non-farm main jobs went from just above 60 per cent to just below 60 per cent. The number of self-employed workers did decrease to some extent, but it was compensated for by an increase in the number of employees in household

⁵ The Labour Force Survey was redesigned in 2007, with a new questionnaire that allows identifying formal and informal businesses. These changes were implemented in collaboration with DIAL in the frame of the project described in chapter 1.

businesses. Employment in private corporate enterprises (accounting for both domestic and foreign capital) did increase significantly (from 15 to 23 per cent), but mostly at the expense of public jobs.

This simple labour perspective makes the prevalence and persistence of the HBIS sector evident; high growth did not translate into a significant drop. At this rate (an already unlikely hypothesis), it will take little less than a century for the HB sector's share in employment to disappear.

The number of household businesses in Vietnam in 2014 was not less than 9 million. This estimation, obtained by counting the number of self-employed workers as main or secondary activity from the LFS, is subject to some caution (using an alternative survey such as the Household Living Standard Survey, leads to some variation). It is nevertheless high. Besides grasping their overall importance, a second step of this introduction questions the dynamism of these production units. Numerous or not, they may well group together almost exclusively unproductive, subsistence activities. It is thus helpful to provide some international comparisons: how dynamic are Vietnamese microenterprises?

2. Microenterprises' dynamism: is there a Vietnamese specificity?

Microenterprises are predominant all over the developing world, and yet are not often considered an engine of growth. Even when the HBIS sector seemed to play a major role in the Vietnamese transition, a rather classical question subsists: to what extent do these self-employed jobs come down to subsistence activities? In other words, does the well-known segmentation of the HBIS sector between subsistence and more professionalised microenterprises take different proportions in Vietnam? To provide this international perspective, I rely on comparable data from three other countries: Madagascar, Côte d'Ivoire, and Peru. All reached different development stages at the year considered (2012 to 2014). Madagascar's income per capita reached 24 per cent of Vietnam's, which itself is almost 30 per cent higher than Côte d'Ivoire's income per capita –but accounts for just 30 per cent of Peru's. They form a continuum of output level, and also differ significantly by health and educational achievements. This comparison of microenterprises' characteristics thus provides a benchmark with various development levels.

The challenge of this exercise is one of comparability of the information on microenterprises. Survey data on the informal sector is indeed rarely available, and when it is, it is seldom representative. In the four countries considered, not only is quantitative information available, but also the methodologies of all surveys are drawn from the same mould. They are indeed different forms of mixed-surveys, the principle of which is to combine two phases: a labour-force survey as “phase 1” at the household level, and then an enterprise-type survey as “phase 2” at the production unit level. These surveys were elaborated by DIAL,⁶ and have been conducted in a growing number of countries over the last decades.

In the case of Vietnam, this study relies on the annual 2014 Labour Force Survey (LFS) as “phase 1”, and the 2014 Household Business and Informal Sector Survey (HB&ISS) as “phase 2”. The LFS is conducted quarterly as a rotating panel, and included in 2014 50,640 households per quarter, equivalent to 16,880 households per month. The HB&ISS used as second phase was conducted by DIAL and the Vietnamese Academy of Social Sciences in 2014 among 3,411 household businesses. The Malagasy surveys are the two phases of the 2012 “Enquête sur l'Emploi et le Secteur Informel” (ENEMPSI), conducted in partnership with DIAL with support

⁶ Développement, Institutions, Mondialisation; research team of the Institute of Research on Development. Additional information can be found in Roubaud & Seruzier (1991), quoted in chapter 1. See also Cling, Lagrée, Razafindrakoto, & Roubaud (Eds.), *The informal economy in developing countries* (pp. 309–326). London and New York: Routledge.

from UNDP and the ILO. The first phase was conducted with 11,300 households, and the second phase included all identified production units, 5,700 in total. Côte d'Ivoire and Peru surveys share many common points with these surveys, as they are originally based on the same scheme, but they included a module on non-agricultural production rather than a separated "phase 2". While the level of details is lower, comparability remains high. The Peruvian data is the 2014 annual Encuesta Nacional de Hogares (ENAHO). It was carried out at national level, with support from the Inter-American Development Bank (IADB), the World Bank and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). The survey is continuous and the annual data comprises 40,125 households. Finally, for Côte d'Ivoire I used the 2014 Enquête Nationale sur l'Emploi et le Travail des Enfants (ENSET), which received technical support from (among others) the ILO, UNDP, and the Ecole Nationale de Statistique et d'Economie Appliquée. 12,000 households were systematically drawn from 600 enumeration areas in the whole country. Combining these data enables us to compare the overall incidence of self-employment, as well as the main characteristics of microenterprises in these countries. All figures use sampling weights to ensure their representativeness at the national level.

A first angle of interest is the extent to which employment in the HBIS sector varies with income. Wage employment is dominant in high-income countries, while self-employment is the norm around the developing world.⁷ This simple observation largely justifies the assumption of a rapid decrease in the informal sector with economic growth. Looking at the four countries considered here, it seems that it is not the case. Table 1 reports the incidence of self-employment (which includes both employers and own-account workers, i.e. microentrepreneurs working alone), as percentages of the non-agricultural labour force. Except in Côte d'Ivoire where it concerns more than half of individuals, a surprisingly comparable percentage of workers (ranging from 32 to 38 per cent) are engaged in self-employment. Without drawing conclusions on the average link between development and the incidence of self-employment, it suffices to notice that its level in Vietnam is comparable with a much poorer country (Madagascar), and a much richer one (Peru).

⁷ Self-employment represents around 4.4% and 7.2% on average in the OECD countries for women and men respectively (OECD, 2008)

Table 1. Incidence of self-employment (% of the labour force)

	Vietnam			Madagascar			Côte d'Ivoire			Peru		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Employer	2.54	4.46	3.45	2.56	3.40	2.95	0.92	1.69	1.52	2.06	4.63	4.41
OAW	30.71	27.84	29.35	38.28	31.46	35.12	62.49	50.26	53.06	39.63	30.96	31.71
Total self-employment	33.25	32.30	32.80	40.84	34.86	38.06	63.42	51.95	54.57	41.70	35.59	36.12

Author's calculation based on Phase 1 surveys: Labour Force Survey 2014 (Vietnam), Enquête Nationale sur l'Emploi et le Secteur Informel 2012 (Madagascar), Enquête Nationale sur l'Emploi 2014 (Côte d'Ivoire), Encuesta Nacional de Hogares 2014 (Peru). Restricted to working-age population (15-64). All figures exclude jobs in the Agricultural sector.

The similar incidence of self-employment among these countries of contrasted development stages is coherent with the persistence of the HBIS sector suggested above in the Vietnamese case. Beside its incidence, a second angle of interest is to compare the characteristics of the household business sector. The characteristics of businesses (size, premises, registration, branch, and equipment), or individuals (age, sex, education, and motivation for starting) are illustrative of the specificities of Vietnamese businesses. Table 2 provides this descriptive comparison. According to almost all indicators, they are in a better position than in other countries, including Peru. Although remaining on a small scale, they employ on average more workers than in other countries, reaching an average size of 1.9 workers (including the owner), while Malagasy and Peruvian household businesses reach only 1.5. Their conditions of operation are undoubtedly better; 28 per cent have dedicated professional premises (against 11 to 21 per cent elsewhere). Perhaps more importantly, a much lesser share operates outside (22 per cent, compared to 42 to 61 per cent). Business registration is almost inexistent in Madagascar and Côte d'Ivoire, but in Vietnam 26 per cent of micro firms were already registered. Access to equipment for production purposes (electricity, internet, phone), which is linked with the quality of premises as well as the ease of access to infrastructures, is again much more frequent among Vietnamese microenterprises than their counterparts in Madagascar and, more surprisingly, Peru. Looking at the average values already gives an idea of the singularity of Vietnamese microenterprises.

Table 2. Characteristics of microenterprises and of their owners

	Vietnam	Madagascar	Côte d'Ivoire	Peru
Size (# workers inc. owner)	1.89	1.47	1.77	1.51
Premise: outside (%)	0.22	0.42	0.61	0.46
Premise: at home	0.50	0.37	0.27	0.37
Premise: dedicated	0.28	0.21	0.11	0.17
Registration (%)	0.74	0.92	0.96	0.83
Branch: Manufacture (%)	0.26	0.42	0.23	0.15
Branch: Trade	0.36	0.39	0.49	0.34
Branch: Services	0.37	0.19	0.28	0.51
Access to water (%)	0.22	0.09		0.13
Electricity (%)	0.60	0.08		0.32
Phone (%)	0.43	0.08		0.03
Internet (%)	0.07	0.00		0.03
Written accounts (%)	0.28	0.14	0.34	0.28
Age	44.11	37.80	36.76	42.47
Sex: male (%)	0.47	0.46	0.40	0.49
Education: primary or less (%)	0.34	0.56	0.75	0.27
Educ.: upper sec.	0.56	0.39	0.22	0.45
Educ.: college or tert.	0.10	0.06	0.03	0.28
Motivation: by default (%)	0.22	0.22		0.58

Author's calculation based on Phase 2 surveys in Vietnam (HB&ISS 2014) and Madagascar (ENEMPSI 2012 phase2), and on non-agricultural modules in Côte d'Ivoire (ENSETTE 2014) and Peru (ENAHO 2014).

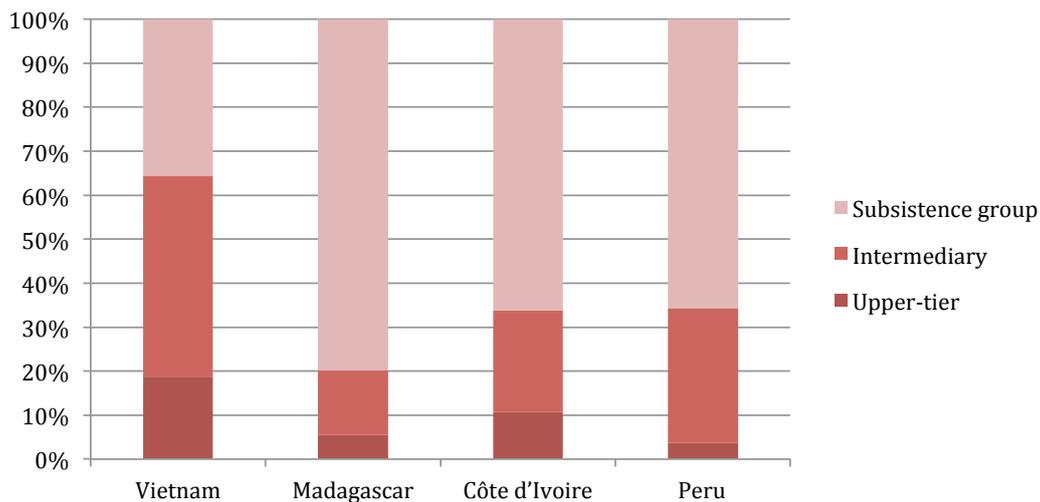
The heterogeneity of the informal sector in the developing world is well known. Professionalised businesses coexist with purely subsistence activities, and with high potential -but constrained- ones. The third angle of interest in this comparative approach is accordingly to go beyond the comparison in means, to compare the relative weight of each segment. How do these countries compare as regards the relative importance of the “necessity-based” microenterprises, by contrast with the “professional” (assumably having a higher potential) or “intermediary” entrepreneurs? One could expect the development stage to be associated with a decrease in the share of necessity-based self-employment. The results show, however, that Vietnam comes out as a specific case among these (limited number of) countries.

Using all the business and individual-related characteristics,⁸ I use a multiple correspondence analysis (MCA) followed by a clustering process for each country to identify the relative share of these groups in the microenterprises' population. This approach was first applied by Cling *et al.* (2010) on survey data representative of the informal sector in Hanoi and Ho Chi Minh City. The

⁸ With minor variations due to data availability by country, the variables include : size (number of workers), type of premises, informality, sector, access to equipment, age, sex, education, ethnicity, location, motivation for starting, pricing method, and use of written accounts.

MCA enables us to identify the underlying structure of the data as regards these observable characteristics. The clustering process on the resulting scores (using the two main axes) identifies three groups of businesses by country.⁹ More elaborated cluster analyses are able to identify additional groups (such as high potential “gazelles”; Grimm, Knorrige & Lay, 2012), but this cross-country comparison gains from simplicity. Figure 3 displays the results of clustering by country, revealing the relative weight of each segment. The “upper tier” group includes relatively larger microenterprises operating in better conditions, and managed by better-educated individuals. In Vietnam, this segment includes one fifth of microenterprises. It is comparably small in all other countries (accounting for 4 to 11 per cent of the population). Conversely, the group of more precarious businesses (operating outside, run by older individuals, using no written accounts, typically unregistered) is almost twice as large in Madagascar, Côte d’Ivoire and Peru as it is in Vietnam.

Figure 3. Distribution of microenterprises by cluster.



Authors’ calculation based on Phase 2 surveys in Vietnam (HBIS 2014) and Madagascar (ENEMPSI 2012 phase2), and on non-agricultural modules in Côte d’Ivoire (ENSETE 2014) and Peru (ENAHO 2014).

The link between growth, development, and the segmentation of the microenterprises sector is complex, and the above comparison may reflect different phenomena (including the availability of formal jobs, or lack thereof). The dynamism of the Vietnamese microenterprises sector is however apparent. Household businesses are, on average, better off than their counterparts in other parts of the world. In addition, the more precarious segment of firms represent a much lower share than in poorer (Madagascar) or richer (Peru) contexts.

⁹ I used a kmeans clustering. It can be understood as an interactive process where each observation is assigned to the group whose mean is closest, and then based on that categorization, new group means are determined.

Despite the many challenges ahead, among which rising inequalities and persistently high corruption, Vietnam did achieve unquestionable economic progress since the “renovation”. The role that microenterprises played in it is difficult to elude. The informal sector in Vietnam is indeed still predominant in that it employs most of the non-agricultural labour force. It is also dynamic, as it seems to be made of a larger share of professionalised businesses than in other low or middle income countries. Does this imply that this sector should be regarded as a powerful engine of growth? Without going this far, the comparisons in time and across countries are telling on its *potential* importance in the development process. Given the large numbers of individuals employed, supporting the informal sector may be, at the very least, an indigenous solution to getting many out of poverty. Giving some consideration to these microenterprises, and further thinking of possible support policies, does make sense.

Chapters summary and contextualisation

The first part of this general introduction aimed at showing the importance of the microenterprises sector. This second part provides additional elements of contexts related to the specific questions asked throughout the chapters. It may however be of interest to characterise firstly the context of the thesis itself, in which lies part of its originality. This whole research project was initiated by my involvement as research assistant in the DIAL/GSO partnership (Développement, Institutions, Mondialisation / Vietnamese General Statistics Office) in Hanoi in 2010-2011. The first two surveys had been conducted in 2007 and 2009.¹⁰ My role was mainly to work on the panel data, provide technical support for the renewal of the Labour Force Survey, and suggest policy recommendations for informal microenterprises. I later (by the end of 2012) based my PhD project on some of these observations. But most of the questions I chose to deal with result from direct observations of the daily constraints faced by informal sector workers. Indeed, I spent almost three years in Ho Chi Minh City between 2012 and 2015, as close as can be to the “observation units”. I was first hosted by the Ecole Française d’Extrême Orient, and then by the University of Economics in Ho Chi Minh City. If most of the papers use quantitative techniques, I also conducted fieldwork. I went to interview some of the informal sector workers that were surveyed by the GSO, in order to understand what lied behind the variables. I had the same troubles than business owners to understand the registration procedures (probably more, in fact). I observed the trade-off that some face between buying material for the household business and spending on health care. I wondered what could happen if some businesses were better managed. This positioning may not be frequent in quantitative Development Economics, and I do not argue that it is essential, but it certainly provided me with a better understanding of the topic. It may in turn have enabled me to better identify key problems.

The three chapters are consequently coherent, and highly complementary. They provide a better understanding of the pitfalls that informal household businesses need to overcome. The key of the approach I adopted in this PhD research project is the following: what should matter for public policies is to improve people’s lives, and not to achieve modernising ambitions (such as formalizing) *per se*.

¹⁰ The project was led by M. Razafindrakoto, J-P. Cling, and François Roubaud. The Vietnamese team involved Nguyễn Thị Thu Huyền, Đào Ngọc Minh Nhung, Đinh Bá Hiến (Institute of Statistical Science) ; Nguyễn Thị Ngọc Lan, and Nguyễn Đức Cảnh (Population and Labour Statistics).

The remainder of this introduction provides descriptive elements, to help the reader who is not familiar with Vietnam understanding the context of each chapter. The first chapter deals with formalization, and the importance of business registration. But what are the actual procedures that one has to meet to get a business licence? How may it influence microenterprises' performances or operating conditions? The second and third chapters relate to health: how frequent are adverse health events among micro entrepreneurs, and how may they affect their business? What is the state of the health insurance scheme in Vietnam, which should offer financial protection against the costs of sickness? Finally, the last chapter investigates the importance of managerial capital: how common are "good" business practices among this population? All figures from this section are drawn from the 2014 HBIS survey (HB&ISS), briefly described above. I was involved in different stages of the survey, such as questionnaire design and weighting. All tables and figures use sampling weights; this data thus provides representative figures at the national level for the household business sector.

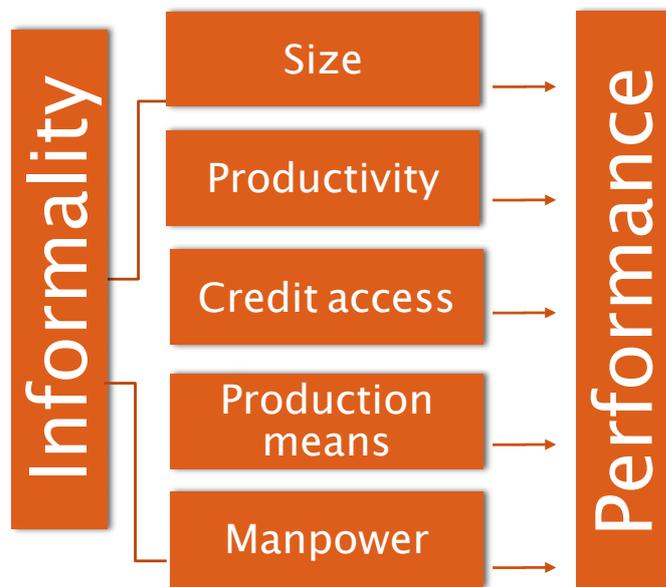
1. Do informal businesses gain from registration, and how?

Summary. In the first chapter, I investigate the implications of the distinction between *formal* and *informal* household businesses by measuring the effects of formalization. To do so, I rely on a panel of household businesses, and apply quasi-experimental methods to compare household businesses that remained informal with those that joined the formal sector. The panel is made of two rounds of the Household Business and Informal Sector Survey (2007 and 2009). This data was collected during a joint research project between the French Institute of Research on Development, and the Vietnamese General Statistics Office, in which I was involved prior to my PhD. I find that formalization does have a large impact on performance, as it translates on average into a 20 per cent increase in value added. This result confirms the importance of the legal status of microenterprises. The richness of these data also enables us to investigate the effect on intermediate outcomes: microenterprises that formalize can access better equipment, and increase their scale of operation –which translates in turn into increased performance. Finally, I show that the effect is not homogeneous: only the initially larger businesses benefit from registration, while it makes no difference among own-account workers.

The contribution of the first chapter is put in perspective with the existing empirical literature on formalization in graph. 1. The two other papers asking the question in the same terms are Rand & Torm (2012), and de Mel, McKenzie & Woodruff (2013). They both analyse the effect of formalisation on some final performance outcome, and find positive results. It is thus consensual

at this point that formalization of existing businesses has, on average, positive effects on their performance. The two above-mentioned papers, and the one presented in chapter 1, however differ by the channels that are mainly put forward. de Mel, McKenzie & Woodruff (2013) show that productivity and credit access are significantly improved, and the contribution of Rand & Torm (2012) is able to show an effect on the manpower: the use of casual labour decreases. The richness of the data used in the first chapter's paper lets investigating overlooked channels. The results throw light on the change in scale, and on the access to production means, in addition to underlining the heterogeneity of the process by type of microenterprises (own-account workers or employers).

Graph. 1. Correlates of informality, and channels of influence of formalization: contributions of the empirical literature.



Context. Informality is the norm among microenterprises in many parts of the world: the bulk of the self-employed operate outside any legal framework. This is often the result of a combination of factors, which include initially fuzzy regulations, lack of information, heavy bureaucracy resulting in an administrative burden, and (marginally) pure reluctance to cooperate with the State. But what concretely does it take to register a household business in Vietnam? There are two main types of registration: the Business Registration Certificate (BRC) on the one hand, and

the Tax registration on the other hand.¹¹ Obtaining a BRC requires filling in a form at the Peoples' Committee of the district (Huyện). This form states:

1. The name, address, phone and fax number of the household;
2. Nature and activities of the HB;
3. Capital;
4. Number of workers;
5. Name, ID number, address of the owner and all participants.

It comes with complementary documents: certified copies (which involve a certification service of the local administration) of ID, of practice authorisation (for certain domains), and of invested capital. Upon receiving the file, the People's Committee delivers a receipt, and should provide an answer within three days. There is a registration fee. Its amount is overall low, but difficult to know precisely as it varies in time and by locality (it was three times higher in Hanoi than in Da Nang). These procedures were used at the time of the surveys (2009), and they have changed only marginally since then. A new Enterprise law enacted in 2015 implied numerous and significant transformations for private enterprises but changed little for household businesses.¹²

Obtaining a BRC is, in principle, relatively simple. But the difficult part is to obtain clear information on the procedure. While it is available in principle, this information is neither openly divulged, nor translated from legal terms to understandable forms. Furthermore, the variations between places (for the costs) and sectors make it even harder. For instance, households producing salt, mobile vendors, or sweets sellers are officially exempt from registering “*unless they trade goods from a regulated branch*”. A fixed and unique address is required anyway; registration will be cancelled if the HB changes district.¹³ It is hence almost impossible for the microentrepreneurs themselves to know (without actively looking for information, or being more or less randomly subject to zealous local officials) whether registration is, in their particular case, even compulsory.

The local registration desk sends, in theory,¹⁴ the list of newly registered businesses to the local (Huyện) and regional (tỉnh) tax authorities. The procedures for tax registrations vary by locality. It is often the case that the tax official will visit the business. The required documents are the BRC copy, as well as ID certificate. The duty is then fixed according to the declared monthly turnover,

¹¹ The core of the analysis in the first chapter uses the BRC, and the results are robust using the second.

¹² Decree 78/2015/NĐ-CP. The only actual change for household businesses concerns the list of partners involved.

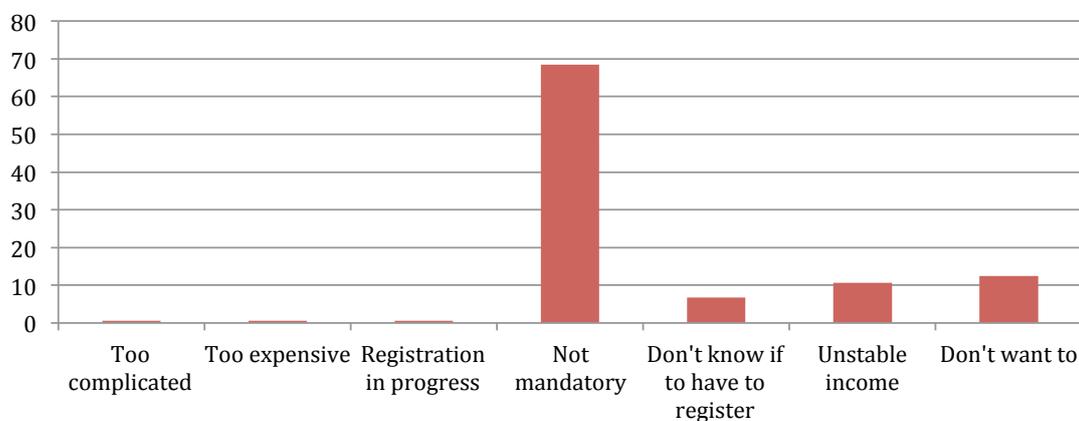
¹³ Decree 43/2010/NĐ-CP.

¹⁴ In practice, some household businesses have a BRC but no tax registration.

with six progressive thresholds. The levels vary from 1.3 to 5 per cent of the annual income. In addition to the duty, household businesses are required to pay a value added tax of 1-5 per cent of income, depending on their position and branch, and an income tax (at a flat rate if there is no written accounts). Once again, the level of knowledge required to understand the specifics of the registration procedures and the tax formula is beyond the reach of the vast majority –who simply follow local officials’ directions when they exist.

The first chapter thus captures, through the effect of registration, a phenomenon where microenterprises emerge from a regulatory grey zone to become fully legal. Seeing how much this allows them to improve their operating conditions, and in turn their performance, one could wonder why formalisation does not happen on a larger scale. Part of the answer lies in the description of the procedures, which although being simple, remain unclear for almost everyone. Further evidence on this is given by the 2104 HB&ISS data. Figure 4 describes the reasons put forward by unregistered microenterprise owners to explain why they do not ask for a business licence. In the overwhelming majority of cases (75 per cent), informal sector workers in Vietnam simply believe that they do not have to register (or “don’t know if they have to” – and consequently, do not).

Figure 4. Reasons for being unregistered.



Authors’ calculation, HB&IS survey 2014, VASS-CAF & IRD-DIAL.

An obvious information problem was at play in 2009 (date of the survey used in the first chapter), and it is still the case in 2014 (date of the last survey, from which the above figure has been taken). Formalization can be seen as obtaining a form of State recognition. The fact that the rules remained largely unclear, and the business largely unregistered, can therefore be seen as symptomatic of a global lack of political attention given to the informal sector (Cling, Razafindrakoto & Roubaud, 2011).

2. Health Shocks and permanent income loss: the Household Business channel

Summary. This chapter was based on a simple empirical observation: in Vietnam, health problems are costly. They are so costly that it seemed impossible for households' non-farm economic activities to be completely protected from their consequences. This observation was confirmed by qualitative surveys. The rationale of the third chapter is accordingly to use a panel of microenterprises, linked with information on health at the household level, to investigate their vulnerability to health shocks within the household. These data were built from two rounds of the Vietnamese Household Living Standard Survey (2006 and 2008), in which microenterprises can be related to the person in charge among household members, and matched between years. At the same time, detailed information on health of all household members is available. It adopts as such an enterprise perspective. I show that health problems of HB operators and/or of other household members have a large and significant negative impact on the businesses' operations. I also determine the mechanisms at play. Health shocks within the household can translate into monetary and time costs. Although intra-household labour reallocation mitigates the labour supply decrease, the increase in out-of-pocket health expenditures at the household level crowds out business-related expenditures, and significantly decreases investment. The amounts of health expenditure that households have to meet in such cases are out of proportion with the size of their economic activity.

There is a vast literature on how health shocks can eventually cause household impoverishment.¹⁵ The point usually made is that medical expenditure can translate into lower consumption, as households have to cut expenditure. None however mention the effects on household businesses, which are evidenced in this chapter. In this regard, this chapter provides a novel angle in the empirical literature on microenterprises, as well as an innovative contribution to the literature on the effects of health shocks in developing countries.

Context. How important is health for microenterprises? How often does poor health impede their activity, and/or constitute a "shock" (in the sense of a large, unexpected expenditure)? Operating a small-scale household business is indeed risky in many regards. A distinguishing feature of these production units is that they largely rely on a single (or in the best cases, a few) worker's labour input. In addition to what is considered common risks for medium or large firms, HB activity may be disproportionately impacted by any adverse event affecting the individual, and sometimes even by those affecting other members from the same household.

¹⁵ Russell & Gilson 2006; Knaul *et al.* 2006; Wagstaff & Van Doorslaer 2003.

While a construction incorporated enterprise will be unlikely to suffer from a worker being ill, even though s/he has major responsibilities, an informal bricklayer will directly lose income for any day spent in bed –and perhaps more because of losing clients upon returning to work. Risks faced by HB are thus twofold: they can affect the business directly, as well as through its owner. Those affecting the business directly include economic causes such as price fluctuations, supply or demand shocks, or raw material availability. The risk exposure must be considered against this backdrop as the addition of risks faced by the business and those faced by the individual operating this business. How does this source of risk compare with “normal” economic risks faced by all businesses?

Suggestive evidence on these questions can be found in the 2014 HB&ISS data. A special module describes the type of adverse events faced by HB operators, and their relative incidence. It appears that HB owners mention health as one of the main problems they face on a regular basis: minor health problems often impede their activity. Furthermore, they frequently experience shocks, and those shocks that are related to health problems are by far the most frequent.

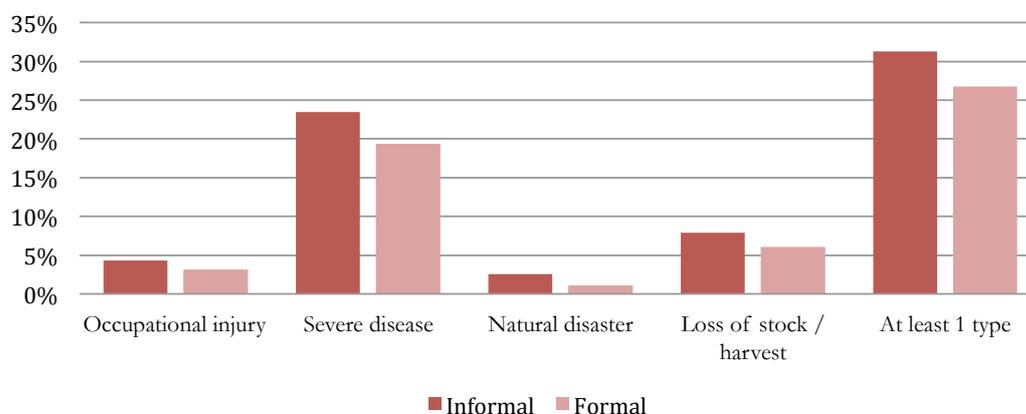
A first comparison can be made between the “problems” encountered by business owners. The 2014 survey asks HB owners to report the items that they perceived as a recurrent impediment to their business, and the possible answers include general economic risks as well as health issues. The results, provided in Table 3, show that a third of HB owners mention health issues as being a moderate or major problem. More common problems of insufficient sales or cash flow are the most often mentioned, but health issues rank second in the list of severe problems, far above economic risks such as price instability or supply or raw materials.

Table 3. Main problems encountered (percentage of HB)

	Informal HB		Formal HB		All HB	
	Problem	Severe problem	Problem	Severe problem	Problem	Severe problem
1. Sale of production	41.7	10.5	56.4	21.1	45.5	13.3
2. Financial-Cash flow	32.1	7.7	31.1	7.5	31.8	7.7
3. Health issues	31.3	9.3	25.5	4.5	29.8	8.1
4. Access to credit	25.2	6.3	28.5	6.7	26.1	6.4
5. Supply of raw materials	15.7	3.5	25.1	3.1	18.2	3.4
6. Premises	15.7	6.1	17.9	4.3	16.3	5.6
7. Inflation	15	3.1	16.1	4.2	15.3	3.4
8. Lack of machines or equipment	13.2	2.3	11.5	1.3	12.7	2.1
9. Crime, theft and disorder	8.4	2.2	11.4	2.3	9.2	2.2
10. Transportation	7.7	1.8	11	1.9	8.6	1.8
11. Corruption	3.2	0.4	4.1	0.3	3.5	0.4
12. Other	2.9	2.1	2.1	0.8	2.7	1.7
At least one severe problem	.	33.8	.	35.7	.	34.3

Note: Since each HB can mention more than one problem, the column sums could be greater than 100 percent. Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL. Courtesy of the DIAL-CAF team (Le Thi Thuy Linh and Tran Thi Minh Tam).

Turning to the incidence of major shocks rather than common problems, the overall risk exposure of household businesses is apparent in Figure 5. I report the answers of HB owners when asked about the shocks that generated “significant expenditure” over the past 24 months—a recall period and phrasing that leave only the more significant events. 30 per cent of HB owners experienced at least one type of shock; whether a loss of stock to theft or climate events (7 per cent), a natural disaster (2 per cent), a work-related injury (4 per cent), or a severe disease in the household (21 per cent). Informal businesses and their owners are in all aspects more vulnerable than formal businesses. Among the significant expenditure resulting from a shock in the past 24 months, three cases out of four were related to health.

Figure 5. Adverse events experienced by HB owners (percentage of HB)

Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL; authors' calculations

On the one hand, health is a common impediment for HB owners; it is mentioned as a problem more often than the lack of credit. On the other hand, health has by far the highest incidence among the shocks faced by informal sector workers: one informal entrepreneur out of four (one out of five in the formal HB sector) had to cope with significant expenses after a severe disease of the worker or a family member in the past 24 months. These simple descriptive elements show the importance of health among micro-firms, and help contextualize the results of the second chapter. Health care is indeed costly in Vietnam, at least since the introduction of user fees in the early 1990s. Along the path of its transition towards a “socialist oriented market economy”, the country shifted from state-funded health-care to a privatized user fee system (Nguyen *et al.*, 2012; Sepehri, 2014). The out-of-pocket payments quickly rose, and absorbed around 5% of total household consumption on average in 2007 (Van Doorslaer *et al.*, 2007). Public health care is still underfunded and the demand for unofficial payments is large. This context explains why health shocks might translate into particularly large health expenditure, and weigh directly on the economic activity of microenterprises.

3. Can Insurance Mitigate Household Business Vulnerability to Health Shocks?

Summary. The second chapter evidenced the vulnerability of microenterprises to health shocks; the third one questions the mitigating potential of health insurance as regards this vulnerability. I rely on the same survey as in the second chapter (the VHLSS), focusing the core of the analysis on the 2006 data. I exploit a discontinuity in the proportion of children having health insurance following a 2005 reform. This setting enables me to compare otherwise similar microenterprises, which differ only by the proportion of children insured in the household. I show that health insurance does not offer sufficient financial protection to mitigate HB vulnerability. The health insurance coverage makes no significant difference to the amount of health expenditures of the household, which indicates low financial protection against the monetary consequences of health shocks. Neither does it let the businesses operate more days on average, which shows that it does not mitigate the time costs (which are a minor element in any case). Health insurance does, however, have an influence through reducing uncertainty: investment is temporarily increased as a result of what seems to be a *peace of mind* effect.

This third chapter focuses on the vulnerability of household businesses to health shocks evidenced in the second chapter, and questions the effects of health insurance against this backdrop. In this sense, it is an innovative way to look at the effect of insurance on the economic activities of poor or near-poor households. In its current form, its ambition remains however limited as it considers only the perspective of health. The identification strategy is also, by nature, implying that results are valid only locally (as do all discontinuities). This paper thus raises new research questions as much as it answers one. It calls for future investigations on the global vulnerability of household businesses, and the impact of other forms of insurance.

Context. Health insurance in Vietnam dates back to 1992, but went through a long gestation period. In 2002, more than 80 per cent of the population still had no health insurance, and among adults who never had insurance, 57 per cent declared, “*not knowing what health insurance is*” (Vietnam Ministry of Health, 2003; Castel *et al.*, 2014). It has significantly gained importance since then. The two pillars of the current system are the compulsory part (to which the *social health insurance* component belong), and the voluntary one (initiated in 2005, although it was planned earlier; Ensor, 1995). The compulsory part covers public sector workers and private sector workers employed for more than 3 months with a labour contract. These categories still amount in practice to a small share of the total number of workers, as a vast majority of jobs belong to

the agricultural and HBIS sector.¹⁶ In addition, the compulsory part includes the *social health insurance* segment. It encompasses all individuals having free or subsidised health insurance through assistance programs (such as poor households and other vulnerable categories, or children since 2005).

How many informal sector workers are enrolled in the health insurance system today, and how did it change over the last decade? As part of the recent efforts in developing social protection, Vietnam officially planned on reaching universal health coverage, which amounts in practice to reaching an enrolment rate of 80 per cent of the population by 2020,¹⁷ and thus implies dramatically increasing the enrolment of HB owners. Their inclusion is challenging by nature, especially because of the limited information on income available to design efficient collection of contributions and link them with sufficient benefits (Castel & Gian, 2010). The HB&IS surveys provide representative figures for business owners (i.e. not including employees in HB), provided in table 4. Significant progress in terms of coverage has been achieved over the past five years: in 2014, more than half (55 per cent) of household business owners had health insurance. In 2007 and 2009, only 14 and 22 per cent of HB owners respectively were enrolled (figures cover only Hanoi and Ho Chi Minh City).

Table 4. Health insurance enrolment among household business owners in 2007, 2009, and 2014.

	Formal	Informal	Total
2007-HN and HCMC	14.8	13.2	13.6
2009-HN and HCMC	27.3	20.8	21.9
2014-HN and HCMC	48.1	41.9	43.4
2014 - whole country	60.9	52.1	54.4

Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL; HB&ISS 2007&2009, IRD/GSO, authors' calculations. All figures except 2014 "whole country" exclude private health insurances, which are marginal, for comparability.

There is a coverage gap in 2014 between formal and informal business owners, as only half of informal entrepreneurs are covered against 61 per cent in the formal sector. Looking at the type of scheme in which HB&IS workers are enrolled, it turns out that an important share of informal HB owners (45 per cent) are covered through the Vietnamese social assistance scheme, mainly by being classified as poor households. A large, though lesser, percentage of formal HB owners are also insured through social assistance (33 per cent). While some workers benefit from a compulsory insurance scheme thanks to contributing through a previous -or current- formal job (or from the extension of another family member's inclusion), this is the case of less than 5 per

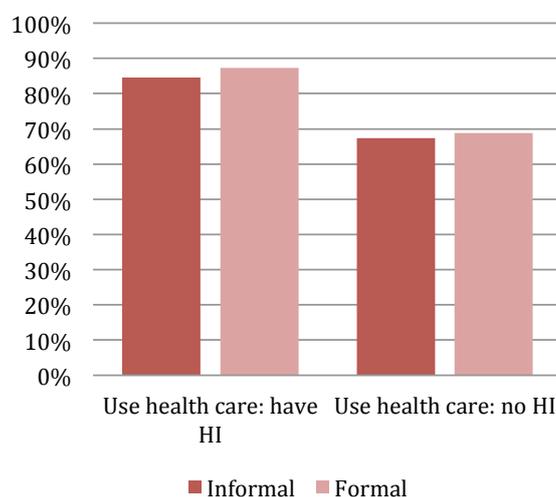
¹⁶ Even in the private enterprise and public sectors, many workers have no contract. Informal employment amounts to almost 10% in the public sector in 2010.

¹⁷ Decision 538/QĐ-TT dated 29/3/2013 states that 70 per cent of the population should be covered by health insurance in 2015, and 80 per cent in 2020.

cent of insured individuals. The remaining half of insured HB owners belong to the voluntary scheme in 2014. The bulk of newly enrolled workers thus joined through buying a voluntary insurance (sold in the districts' people committees). Voluntary health insurance is rarely considered a viable way to reach universal coverage, but it was in Vietnam an efficient means to enlarge health insurance coverage towards informal sector workers.

Increasing enrolment rates is only one aspect of progressing towards universal coverage. The other conditions are the effectiveness of the health insurance scheme in improving access to health care, and in reducing out of pocket payments. Both are interrelated as workers' perception that health insurance does not help improve access to care partly determines participation in the scheme (Amo-Adjei, et al., 2016). A comparison of health care utilization is provided in figure 6.

Figure 6. Utilization rate of health care among HB owners by health insurance status



Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL; authors' calculations among HB reporting illness

It shows the probability to utilize health care services for HB owners who declared having health problems, compared by health insurance status. Conditional health care utilization is found to be higher (85 per cent) among insured HB heads than among uninsured ones (68 per cent). This descriptive comparison is evidently not sufficient to argue for an effect of the coverage status, as self-selection could play a large role in determining insurance coverage. It is however in line with other findings in Vietnam for the same period (Palmer *et al.*, 2015), and suggests that insurance is associated with more care.

Besides increasing health care utilization, health insurance must be evaluated against its actual impact on out-of-pocket health expenditure. As the natural risk-pooling mechanism, it should

indeed protect households against catastrophic payments. The results of the third chapter suggest that the influence of the Vietnamese health insurance in this regard was very low in 2006. A brief comparison based on the 2014 data suggests that it is still the case. Table 5 provides the average total health expenditure over the last 12 months by insurance status in 2014, including payments not covered by the insurance, and all additional payments (medicines, gifts for doctors, etc.). This provides a comparative picture of the level of Out-of-Pocket (OOP) health expenditure by type of insurance. It also relates this expenditure to the HB activity, measured by annual profit.

Table 5. Annual health expenditure (1000vnd) and share of the HB annual profits (percentage)

	Informal		Formal	
	Total Health exp	% of the HB profits	Total Health exp	% of the HB profits
No HI	3,122	27.56%	5,332	10.23%
HI	3,864	46.93%	3,920	15.10%
Total	3,625	40.70%	4,276	13.87%

Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL; authors' calculations

The health expenditure of informal household businesses (IHB) owners still amounts to 41 per cent of the profit generated by their business in 2014. The percentage is higher among insured informal HB operators (47 per cent), which is coherent since they are mostly covered because of being poor, which correlates with operating smaller businesses. It is still large (28 per cent) among uninsured ones. Equivalent figures among formal HB (FHB) are much lower, as health expenditure represents 14 per cent of the FHB annual profit on average (up to 15 per cent among insured). The higher average profits among FHB explain a large part of this difference, but absolute figures also differ. Self-selection is again an obvious concern for going beyond descriptive results, but the main (and worrying) message is that the levels of health payments are overall still very high in Vietnam.

Taken together, the second and third chapters demonstrate the importance of health risks for microenterprises, and point towards the large positive externalities that may lie in the implementation of universal -and efficient- social protection.

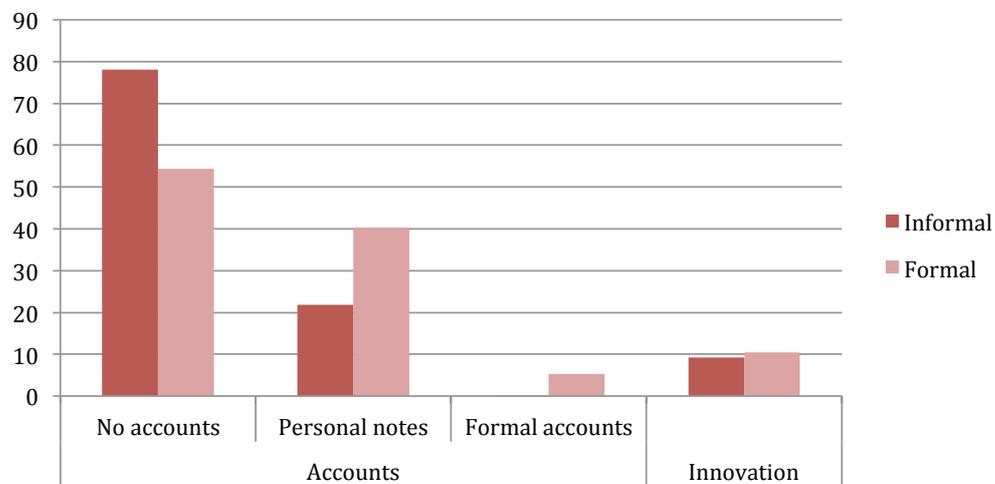
4. Does Managerial Capital also matter among micro and small firms in Developing Countries?

Summary. The fourth chapter turns to a domain that only recently emerged in Development Economics literature: managerial capital. A set of papers (starting with Bruhn *et al.*, 2010) put it forward as an overlooked constraint weighing on developing countries' firms. While a growing body of evidence establishes its importance for large and medium firms, it remains to be investigated among micro enterprises. Evidence found in Development Economics and Entrepreneurial Studies for this population is, at best, mixed. This chapter relies on a different data source than the previous ones: a panel of Vietnamese micro, small and medium enterprises, collected every other year since 2005. Using twelve variables indicating business practices and entrepreneurial attitude, I build a multi-dimensional measure of Managerial Capital. Even when using panel data, this index does not provide exogenous variations: estimations of its impact on firms' performance would likely be biased. The panel data however allows consistent estimates of firm-level productivity. Hence, I investigate the question in a comparative manner. Even though bias might still affect the estimation of the influence of managerial capital on productivity, I am able to show that this influence is as important for micro firms as it is for medium ones.

This fourth chapter adds to an emerging strand of literature. Its contribution lies in that it uses observational survey data to ask a question that was mainly tackled by training programs evaluations. These evaluations were overall limited in statistical power, and restricted in scope as they can only provide insight into the relevance of existing programs. By using large-scale panel data over a six years period, this paper provides evidence on the overall relevance of the concept among a specific population, for which it was far from obvious.

Context. A few elements of context enable us to understand the state of business practices among microenterprises in Vietnam. Some of the indicators used in the SME survey are present in the 2014 HB&ISS data. The main message is that what is considered "good" or standard business practices among larger firms, or among micro firms in high-income countries, has little incidence in the HB sector in Vietnam.

Figure 7. Incidence of business practices among microenterprises



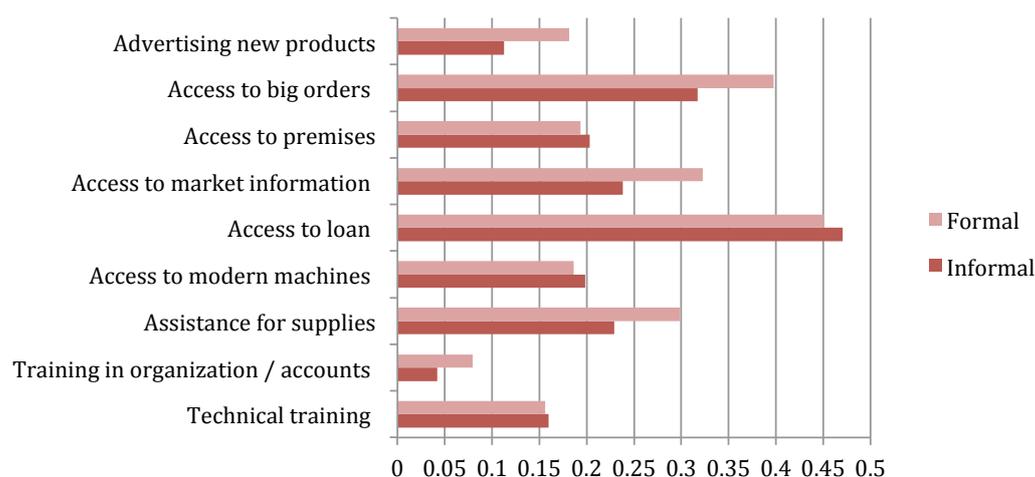
Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL; authors' calculations

Figure 7 describes the use of written accounts, using three modalities, as well as the percentage of firms reporting innovating in terms of products or processes over the last 12 months. Less than 10 per cent of firms did introduce new products or processes, and among those that did, it would probably not be radical innovation. The vast majority of HB owners (72 per cent) have no written accounts at all. 27 per cent use “personal notes”, and only 1 per cent use “complete formal accounts”. On these aspects, informal microenterprises are even more specific than formal ones as nearly 80 per cent of them do not keep books.

The scarcity of these practices among microenterprises does not come as a surprise. Common sense dictates that the use of double entry accounts does not bear the same meaning for own-account workers and for medium-size firms. But even elementary business practices (such as “personal notes” rather than formal accounts) have a low incidence. Additional indicators of managerial capital available in the data include the incidence of behaviours such as new customers prospection, or cost optimisation. In both cases, a minority of business owners give a positive answer. 15 per cent of informal household business owners report actively prospecting new customers in the past 12 months. While 16 per cent might have changed suppliers to reduce costs, less than 1 per cent tried to optimise them by changing premises or limiting manpower costs.

An instructive comparison is to look at the domains in which microenterprises owners report needing assistance. Microenterprises largely lack business skills, but is there a demand for their improvement? Some answers are provided in figure 8. On average, less than two thirds of business owners (68 per cent) report needing any assistance in the first place. Among those who do, the main topic is credit access (45 per cent). Few business owners mention the domains directly related to managerial capital: 13 per cent mention product advertisement, and 5 per cent “training in organisation or accounting”. The more frequent is “information on the market”, which one fourth of respondents mention. While the relevance of managerial capital motivates the recent literature, it seems that business owners themselves are not reporting strong needs on this topic. Further disaggregation, however, shows that this demand is higher among formal household businesses, and also strongly increasing by education level. The demand among owners having reached college or tertiary education is twice that of those having a primary education.

Figure 8. Domains in which HB owners report needing assistance.



Source: HB&IS survey 2014, VASS-CAF & IRD-DIAL; authors' calculations

Does the scarcity of managerial skills and attitude vouch for their irrelevance among informal microenterprises? The recent surge in business training programs in developing countries indicates, on the contrary, that it has been interpreted as a need for business skills enhancement.¹⁸ But the growing collection of programs' evaluations provided little insights into the overall

¹⁸ The number of programs remained limited in Vietnam up to now. The first provider for small business owners in Ho Chi Minh City is the IECD (Institut Européen de Coopération et de Développement). They trained 200 microentrepreneurs in 2015.

importance of managerial capital up to now. Together with the relatively weak demand for assistance on the topic, this context calls for a more systematic, and more general investigation of the association between managerial capital and micro-firms performance. The approach of the fourth chapter is to investigate if the set of elaborated business practices and entrepreneurial attitudes does explain variations in microenterprises' productivity.

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Chapter 1

Do Informal Businesses Gain From Registration, and How?

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Abstract

This paper evaluates the impact of Household Businesses' decision to leave the informal sector on their performance and mode of operation. It capitalizes on a unique panel dataset, the result of a five-year project. Using double difference and matching specifications, we find a significant impact of formalization on annual value added of 20% on average. More importantly, we show that this improvement is not valid for the smallest units, and that it is made possible for the others by changing their operating conditions. Released from the constraints of informality, they can access better equipment, increase their scale of operation, and operate in a more competitive environment.

Acknowledgments

Authors are grateful to all members of the Vietnamese-French team who participated in the IRD/GSO project, funded by the IRD and supported by the World Bank in Vietnam. Useful comments were received at the 8th IZA/World Bank conference on Employment and Development in Bonn, Germany; at the Third World Association's XXIXth Conference on Development, Créteil, France; and at the 6th Vietnam Economist Annual Meeting, Hué, Vietnam. We also received useful comments from the current IRD-Vietnam team, which productively prolonged the project, and numerous relevant observations from three anonymous reviewers.

1. Introduction: why is it worth measuring the impact of formalization on the businesses themselves?

Should we hope that each of the Informal Household Businesses¹⁹ (IHB) that constitute a predominant share of developing economies will formalize in the medium run? Even if the question is rarely asked directly, the answer makes no doubt considering the long-standing negative connotation of informality and the loss of revenue for the State. However, the extent to which micro-firms themselves would benefit from formalization remains unclear.

The question is yet a first-plan research topic. First, it is closely related to the micro-determinants of informality: a large segment of literature defends the view of chosen informality, which implies that the overall size of the informal sector would depend on the perceived costs and benefits of each legal status. Furthermore, estimating the causal impact of registration is a necessary condition to the promotion of policies addressing informality. It is of particular interest in the case of Vietnam since encouraging formalization is one of the national priorities for the country's employment policy pointed out by the Ministry of Labour and Social Affairs. Despite the rapid growth that started after the 1986 liberalization (Đổi mới), and the new status of middle-income country according to the World Bank's classification, the informal sector is still a leading job provider, accounting for almost half of non-agricultural jobs.

If costs associated with formality have been extensively described (De Soto, 1989; Djankov *et al.*, 2002), measuring the gains of registration is not straightforward and raises two major problems: the data requirements and the potential endogeneity.

Given the very nature of the informal sector, quantitative data are everything but easy to produce (ILO, 1993; Razafindrakoto, Roubaud, & Torelli, 2009). The original sin of IHB -being unregistered- keeps them inherently away from statistical systems. They often operate without fixed premises, outdoor or at home, which makes classical enterprises surveys (often census-type) inefficient in capturing this phenomenon. This paper capitalizes on the panel data produced during the five-year IRD/GSO research project²⁰ led by its authors to address the question. Large-scale representative surveys have been conducted in 2007 and 2009 in the two major cities,

¹⁹ The term "household business" (HB) will be used in this paper as a generic term to refer to production units which are private unincorporated enterprises, i.e., enterprises owned by individuals or households that are not constituted as separate legal entities independently of their owner.

²⁰ French Institute of Research for Development and Vietnamese General Statistics Office.

Hanoi and Ho Chi Minh City (HCMC). Both are based on the mixed- survey methodology, principle of which is to identify the IHB heads in a first-phase Labour Force Survey, and to build a sampling frame of IHBs that will be surveyed in a second phase. This methodology allows capturing outdoor unregistered businesses (at least all of those whose heads are included in the population census), and to be representative of the informal sector (ILO, 2013, chap. 6; Roubaud & Sérurier, 1991). Our data include a total of 1,464 Household Businesses (HB) that were informal in 2007, of which 147 formalized before the second wave of the survey in 2009, allowing us to identify the impact of registration on a rich set of intermediate and final outcome variables.

Even when reliable survey data exist, evaluating a plausible causal impact of formalization required three key issues to be addressed. First, businesses that chose to formalize were not comparable with the ones that remained informal: the potential outcomes of the formalized HBs would probably have been different from the non-formalized ones, whatever their trajectory. This selection issue might be explained by *observed* differences that might be fixed in time or not, such as education level, time in business, industry, and location. Second, *unobserved* factors might affect the formalization decision and the outcomes. Some of these factors can be considered as being fixed in time: it is the case of the two major ones, namely the entrepreneur's ability, and her degree of compliance with regulations. They can also be changing over time, in particular if a specific effort is made by local authorities to enforce registration regulations in some locations only.

These two forms of endogeneity have been largely documented and need to be accounted for. We make use of the panel nature of our data to address them by estimating Difference-in-Difference (DiD) models in OLS and Fixed-Effect (FE) settings, and finally by using DiD Matching Estimators (ME). We can fully control for selection on observables as well as unobserved time-invariant characteristics. Some unobserved time-variant sources of heterogeneity might remain in theory, which our DiD specification cannot exclude. To the best of the data's possibilities, we checked the (non-)existence of what appeared to be the main potential source: differentiated changes in local policies.

The third concern is that registration might be partly determined by performance, resulting in a simultaneity bias. This can be true if, for instance, higher profits lead to more visibility and therefore a higher probability to register. We checked for a potential impact of profit growth on the probability to formalize by applying similar dynamic models to those in the core analysis. The lack of significant effects ruled out the reversed causality concerns.

Although the core of the paper relies on this quantitative approach, it also includes the results of two complementary qualitative surveys. The first one was undertaken in 2009 to investigate further the characteristics of IHBs, the motivations of the businesses' heads and their attitude toward registration. In-depth semi-structured interviews were conducted with 60 HBs in the two cities (Cling *et al.*, 2010; Cling, Razafindrakoto, & Roubaud, 2012). The second survey consists in 10 semi-structured additional interviews conducted in Ho Chi Minh City in 2013 with businesses' operators selected from the observations of the panel that had formalized or informalized their activity. The results of both qualitative surveys, in addition to their role in structuring the quantitative approach, are used throughout the paper in the form of quotations.

The ambition of the paper is threefold: (1) to determine what types of already existing informal businesses to choose to formalize, (2) to measure the impact of formalization on performance, and (3) to identify the channels through which this effect occurs by evaluating the impact of registration on their conditions of operation.

We find that (1) Businesses that formalized belonged to the upper tier of the informal sector, save a few own-account workers (OAW).²¹ (2) By formalizing, IHBs increase their annual value added by 20% on average. (3) This is made possible by the release of many of the constraints associated with informality. Joining the formal sector is found to be associated with an improved access to electricity and Internet, to allow an increase in size, improved premises, and a widening in the use of written accounts. Furthermore, micro-enterprises that decided to register operate in a more competitive environment, reporting more problems with competitors. These results however only hold for the biggest IHB. Businesses that were originally own-account workers (individuals working alone) do not benefit from registration, suggesting the existence of a threshold below which there is no gain in formalizing.

The rest of the paper is organized as follows. Section 2 reviews the literature on formalization and its benefits. Section 3 presents the data, and a descriptive analysis of the formalized HBs' characteristics. Section 4 presents the identification strategy and the estimation results. Section 5 provides further robustness checks. Section 6 concludes and suggests some policy implications.

²¹ businesses with a single worker, and no employee.

2. Literature: what are the expected effects of formalization?

The literature handled the question in three ways. The first strand of literature aims at identifying the correlates of informality at the firm level. Although informative, this approach does not allow the effect of informality on outcomes to be isolated: given the selection issue, a direct comparison is required between (otherwise similar) formal and informal businesses. The second strand of literature, to which several recent papers contributed, compares HBs that *are currently* formal and units that *are currently* informal. An additional question handled in the third strand, to which this paper contributes, is the effect of formalization for *already existing* informal businesses. This dynamic vision -comparing units that remained informal and units that formalized- is closer to the actual question for policy makers caused by the existence of a predominant informal sector.

A. The correlates of informality at the HB's level

Throwing a light on the characteristics associated with informality at the HBs level is one of the more documented strands of literature about developing countries. Informality has been shown to imply a number of correlates that are associated with inferior production conditions and subsequently with reduced performance.

First, IHB are generally small. Not only do they largely consist of own-account workers (Maloney, 2004) and subsistence businesses, but also their expansion can be inhibited by the fear of attracting the attention of the authorities. They often operate in a fuzzy legal framework, with which neither informal sector workers nor the police is really acquainted, and often prefer remaining unnoticed. In Vietnam as in several other countries, registration is compulsory only above a certain threshold of size and/or activity that just a tiny minority of workers know. Most of them believe that they are illegal, whether they actually are or not, which may prevent small IHB from growing when they have the opportunity to do so. This point is reflected in many answers obtained in the qualitative survey (Cling *et al.*, 2010, 2012):

- “I did not register my activity because nobody asked me to register. The same goes for all the HBs operating in this street. I think it is a traditional street activity. That's why the State does not ask for registration” (a metal door manufacturer);
- “My business is not registered because I work at home. Local authorities consider that my house is a normal house; they do not ask any questions about my activity. It is not like shops in a big street” (a dressmaker);

- “*It is a small business. I do not know much about the law. Administrative procedures are normally very complicated. Nobody asked me to register*” (a tea and tobacco seller);
- “*I don’t know the legislation. All I know is that when I see the police officers, I have to run away. If not, I will be harassed or pay some money*” (a fruit seller–street vendor);
- “*I do not know the law, but nobody asked me to register. Too bad for the State, good for me because if I had to register, I would have to pay taxes, buy specific protection equipment, it is complicated*” (a plastic tube manufacturer).

The uncomfortable environment, in which IHBs operate, with the risk of being victim of arbitrary decision, is also illustrated by the fact that most of them consider that they would be less subject to corruption if they could register their business (Cling *et al.*, 2012). But since IHBs may also need to feel secure, with cleaner, more predictable government institutions, to consider the formalization of their business (Malesky & Taussig, 2009) they might be trapped in a vicious circle.

Second, IHB allegedly suffer from low productivity, noticeably in the view of Levy (2007). The overall productivity gap between formal and informal businesses is however still subject to caution. It has been documented as regards labour productivity by Benjamin & Mbaye (2012), but converging measurements of high capital returns indicate that micro-firms could be *constrained* rather than *less efficient* (Grimm, Knorringa, & Lay, 2012). Grimm, Krüger, & Lay (2011) measured capital returns for West Africa using 1–2–3 databases representative of the urban informal sector and found them to be very high at low levels of capital (consistently over 70%), and rapidly decreasing with the amount of capital, until 4–7%. De Mel, McKenzie, & Woodruff’s (2008) experiment of randomized grants in Sri Lanka showed returns to be on average of 55–63% per year. McKenzie & Woodruff (2006) also obtained rates of 15% per month among micro-firms having invested less than \$200 in Mexico. Siba (2015) even finds a higher annual median return to capital in the informal sector (52–140%) than in the formal sector (15–21%).

Third, all the results of the above-cited studies corroborate the fact that IHBs face important constraints in access to credit. IHBs are poorly endowed entrepreneurs who operate in a risky environment and access imperfect capital markets. Because they have no legal existence and generally no collateral to offer, IHBs are deprived of access to formal loans, which is only partly balanced by the existence of informal channels (see e.g., Udry, 1993).

Fourth, an explanation of the labour productivity gap often put forward is the difference in production means. IHBs suffer from unequal access to public services. Often lacking fixed

premises, they logically have less access to running water, electricity, or the telephone. Moreover, legal protection and contract enforcement can also be seen as a public good, which the absence of legal status prevents them from accessing. Apart from differentiated access to public goods and services, IHBs generally suffer from challenging access to inputs (Levy, 2007). Inability to enter formal contractual relationships can be associated with difficulties in establishing long-term quality relations with suppliers.

Fifth, the formality of the HB has a contrasted impact on the type of manpower and the labour cost. Formal HBs have a higher unit labour cost than informal ones, as they have to provide workers with social benefits and/or contribute to social protection schemes, and are unable to pay them below minimum wage. In addition, formal contracts may act as risk pooling mechanisms that may attract better quality manpower (Fajnzylber, Maloney, & Montes-Rojas, 2009). On the other hand, they may also have less flexibility to fire workers in case of negative shocks: Almeida & Susanli (2012) argue that informality allows firms greater flexibility in their employment decisions, which, in turn, allows them to operate more efficiently.

As useful as these findings are, they say little about the pure impact of the legal status on the HBs' outcomes and conditions of operation, since such identification requires overcoming the endogeneity of the legal status. Indeed, IHB's underlying characteristics could make firms more productive and at the same time more likely to need formality. As in Lenvenson & Maloney (1998), IHB's performance could make them more likely to be detected by the authorities and hence to formalize (or be formalized).

B. Identifying the effect of legal status on HB's outcomes

i. Cross-sectional comparisons: the choice of being formal

Acknowledging the endogeneity of legal status, several recent studies isolated its effect on performance for newly created businesses. Fajnzylber, Maloney, & Montes-Rojas (2011), examining the impact of choosing formality on revenue, employment and capital stock in Brazil, find a positive effect on the three variables. Newly created firms that opt for operating formally show higher levels of revenue and profits, employ more workers, and are more capital intensive.

In a previous paper, Fajnzylber *et al.* (2009) showed in the context of Mexico that micro-firms that participate in credit markets, receive training, pay taxes, and belong to business associations

exhibit significantly higher profits (20%). Moreover, both tax registration and access to credit increase the likelihood of firm survival, i.e., the probability of staying in business.

Although positive overall, the effect of registration on profits can be highly heterogeneous, depending on the type of businesses considered. McKenzie & Sakho (2010) measure the impact of formality (in the sense of tax registration) on profitability among Bolivian micro-firms, using the distance from the tax office as an instrument. They find it to be significant for the medium-sized firms of their sample, but surprisingly enough to be negative for small and large businesses.

The channels through which the alleged benefits occur remain subject to caution. Fajnzylber *et al.* (2011) argue that it is not thanks to credit access or contracts with large firms, but through a shift in production means, becoming more capital intensive. In particular, the choice of a permanent location is supposed to facilitate capital and employment extension, and thus firms operate on a larger scale.

All of these findings are valid in the hypothesis of HBs choosing between formality and informality, but are not looking at the impact of formalization on existing informal HBs. This issue is yet of prior importance from the point of view of the policy maker confronted with an existing and predominant informal sector. The results may differ for already existing informal firms that choose to formalize, and they may occur through different channels. Although transition towards formality is the more frequently shared objective when dealing with informal Household Businesses (Bacchetta, Ernst, & Bustamante, 2009; ILO, 2015; Jutting & de Laiglesia, 2009; World Bank, 2008), very few studies exist to plausibly measure the benefits from the firms' point of view.

ii. Dynamic comparison: what is the impact of formalization on existing businesses?

The data requirements to directly measure the effect of already existing informal firms' registration are higher and make studies scarce. The more frequently handled related question is whether all types of businesses are potentially concerned, and when does the decision take place.

Fajnzylber *et al.* (2011) argue that formalization is not relevant for all types of businesses. The intrinsic characteristics of many IHB make them unlikely to ever grow large enough to need institutions and formalization. De Mel *et al.* (2008) also question the potential of small IHBs for income growth. Indeed, many of the subsistence businesses addressing local clients may not have the ambition, nor the possibility, to enlarge their scale of operation and enter the formal sector.

At least for a segment, the question is however relevant, but the requirements to provide robust empirical evidence make the studies scarce. Two papers, using two different approaches, investigated the question from this angle. The first approach (de Mel, McKenzie & Woodruff, 2013) uses randomised incentives to formalise among micro firms in Sri Lanka. They show an increase in mean profits driven by several fast-growing firms. The second approach relies on panel data, which require following the same units over time, and including both formalized and still informal units. Such panel data have been collected only twice, to the best of our knowledge, and both times in Vietnam: the large-scale Household Business & Informal Sector Survey used in this paper on the one hand, and the Small and Medium Enterprise Survey by CIEM on the other hand. Rand & Torm (2012) used the latter dataset, and documented a significant effect of registration on profits and investment, and additionally a decrease in the use of casual labour. However, their data suffer from several limitations. First, it is not representative of the Vietnamese informal sector: all IHB were included by on-site identification, and thus operate alongside formal enterprises. The average size of IHB is around four full-time employees, which is far from the actual figure of 1.5 (Cling *et al.*, 2010). The possibility remains that their results are driven by a small segment of the informal sector, namely the biggest firms that correspond to the view of the Legalist School and deliberately chose to hide their output. Following McKenzie & Sakho (2010), one can argue that firms' owners of this segment are of higher ability and thus benefit more from formality (investment in particular). Secondly, data do not allow investigating through which channels the overall positive effect occurs.

The present paper builds on an unparalleled panel data covering the lower tier of the informal sector businesses to contribute to the last strand of literature, and tentatively identify the channels that lead the effect of legal status on the performance of existing IHB.

3. Data and descriptive statistics

The authors of this paper have undertaken, in response to a technical assistance request from the Vietnamese General Statistics Office (GSO), a five-year research project that aims at measuring the size and characteristics of the informal sector. This paper capitalizes on the panel data produced during this project, of which some methodological strong points should be stressed. It is based on micro data drawn from a mixed-survey, and is thereby representative of the urban informal sector. Furthermore, the questionnaire allows the outcomes of informal household businesses (IHB) to be measured with great precision, reconstructing their (often missing) accounts homogeneously.

We adopt an operational definition of the informal sector in line with international recommendations (ILO, 1993; OECD, IMF, ILO, & CIS-STAT, 2002). That is, the whole set of unincorporated household businesses that are unregistered as regards business license.²² Other types of registration criteria are sometimes used: social security, tax code. Since our data include all of them, we chose to conduct the core analysis with business registration in order to stay in line with the literature on informality in Vietnam, and to use an alternative definition for robustness checks.

A. Capturing Informality in survey data: the HB&ISS sample design

Informal Household Businesses often operate without fixed premises, outdoors or at home, which prevents the use of classical sampling frames. The survey data used in this paper overcomes the absence of sampling frame by applying a mixed household/enterprise methodology. In a first phase, informal businesses heads are identified through a set of questions in the Labour Force Survey.²³ In a second phase, the Household Business and Informal Sector Survey (HB&ISS) is conducted on a sample of those production units.

HB&IS surveys have been conducted in Hanoi and Ho Chi Minh City (HCMC) in 2007 and 2009, including both formal and informal units. Descriptive results and detailed information about the survey quality have been edited in a book (Cling *et al.*, 2010). In particular, they show

²² Confusion still prevails on the definition of informality. Close substitutes are sometimes employed (moonlighted/underground/unregistered/shadow Economy, etc.), and the term “informality” can be misused to refer to illegal activities (which are a tiny minority of unregistered household businesses).

²³ In 2009 among the 4,500 households surveyed by the LFS in Hanoi and HCMC, about 2,300 individuals are the head of a HB in their main or secondary job.

that the traditional source used to measure the informal sector in Vietnam (the *Non-Farm Individual Business Establishments Survey*) is plagued by a massive under-estimation. In the two cities less than 30% of the total IHBs are covered by the latter survey, with a strong bias toward the bigger ones. The two rounds of HB&IS surveys constituted the first reliable estimates of informal employment and the informal sector in Vietnam, and to our knowledge the first panel data representative of the urban informal sector firms worldwide.

The sample contains 2,594 respondents in 2007 and 1,983 in 2009; overall, 611 respondents were not matched between the two years. The attrition process is all the more important to take into account that informal businesses are allegedly less lasting in business than formal ones (Fajnzylber *et al.*, 2009); if the process is non-random the results would be biased. Mortality rates (HB that stopped activity) are high in both cities (14% and 19% of the total sample in Hanoi and HCMC respectively), but thanks to the scrutiny of interviewers, the “pure” attrition rate is low (9.1% and 12.1%).²⁴ During the second survey, all the HBs that changed location within the cities or disappeared were tracked through family members or neighbours. In order to check the randomness of the attrition process combined with mortality, we conducted Becketti *et al.* (1988) tests on the whole sample. We computed *F*-tests of the joint significance of the attrition dummy and the interaction control variables on all outcomes of interest. For none of them is it possible to reject the randomness of the attrition process.

After balancing the panel between years and excluding non-response, we obtain a total of 3,966 observations of both formal and informal household businesses (1,983 per year); 1,968 in Hanoi and 1,998 in Ho-Chi-Minh City. Household businesses that were informal in the initial year, on which we mainly focus in this paper, represent 73.8% of the sample (2,928 observations). The core of the analysis focuses on the sub-sample of the 1,464 initially informal businesses (in bold in Table 1), and compare treated (the 147 observations which formalized) to control (the 1,317 observations which remained informal) respondents. In other words, the identification relies on the businesses that were operating informally in 2007 and shifted to the formal sector (i.e., obtained a business license) before the second wave in 2009.

²⁴ A complete descriptive analyses of informality dynamics and attrition can be found in the survey report: Demenet, A., Nguyen, Thi Thu Hien, Nguyen, Huu Chi, Razafindrakoto, M. & Roubaud, F. (2010) Dynamics of the Informal Sector in Hanoi and Ho Chi Minh City : Main findings of the Household Business and Informal Sector Survey 2007 and 2009. Technical Report 325, GSO, IRD, World Bank, DFID, Hanoi.

Table 1. Observations, attrition, and incidence of formalization

	Formal 2009	Informal 2009	Balanced panel	Ceased activity	Other not surveyed	Total 2007
Formal 2007	397	122	519	92	100	711
Informal 2007	147	1,317	1,464	350	69	1,883
Total 2009	444	1,339	1,983	442	169	2,594

B. Descriptive statistics: which types of businesses chose formality?

A first descriptive analysis comparing treated and control units alongside outcomes and control variables shows that both groups were different in their characteristics, initial conditions and evolution.

i. Head's and Businesses' characteristics

A recurrent idea in the literature is that formality choice typically occurs when the firm is created, or that new businesses go through a first period of informality before getting registered. It appears in our data (Table 2) that already existing informal business that choose registration are not operating for a significantly higher (or lesser) number of years than others (with an average of 6.4 years of existence in 2007). This result suggests that formalizing remains an option for businesses that were created as informal ones long after the hypothetical test period. However, they differ by their sectorial repartition since most of the formalized units operate in the trade sector, and very few in manufacture. The comparison also reveals interesting patterns as regards heads' characteristics. They were more frequently led by males, with a better education (less than half as many to have a primary education or lower; 80% have reached upper secondary school). We included the motivation for starting business as an additional proxy for head's ability. It appears that the proportion of heads who started their business to be independent is higher among the formalized units. Taken together, this evidence tends to indicate a higher ability of entrepreneurs who chose the formal sector.

Table 2. HB&ISS panel: observations and basic control variables

	2007		P-Value
	Formalized (Treated)	Still informal (Control)	
Observations	147	1,317	
<i>A. IHB characteristics</i>			
City: Hanoi	0.48	0.52	0.329
Age	6.39	6.41	0.973
Industry: Manufacture	0.14	0.20	0.070
Industry: Trade	0.46	0.32	0.001
Industry: Services	0.41	0.48	0.082
<i>B. Head characteristics</i>			
Sex: male	0.52	0.42	0.028
Migrant	0.05	0.04	0.306
School: primary or lower	0.13	0.25	0.001
School: upper sec.	0.80	0.70	0.009
School: college or more	0.07	0.05	0.208
Age	44.25	43.81	0.633
Motivation: no work	0.29	0.35	0.205
Motivation: better income	0.27	0.22	0.167
Motivation: independent	0.34	0.24	0.007
Motivation: other/family	0.10	0.19	0.003

Additionally, the consistency in non-varying variables over the two survey rounds suggests our data are of high quality.

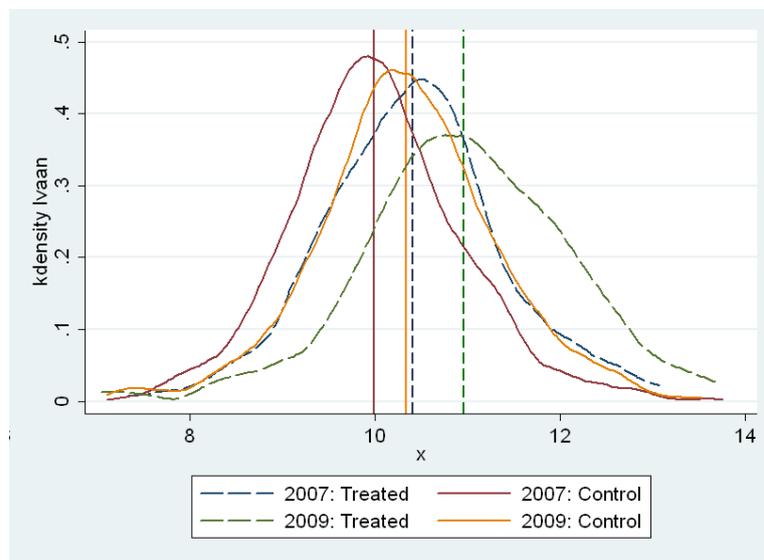
ii. Initial performance and evolution

No consensus has been reached on the appropriate measure of outcomes for micro-enterprises in the literature on the subject. In the rest of the study, we focus on Value Added (this choice is made in Grimm *et al.*, 2011, among others) defined as the difference between turnover and intermediate consumption (which includes cost of products, raw material, self-consumption, rent, utilities like electricity and water, and other expenses), and measured in log of nominal annual value. Such a variable integrates labour income, profits of the entrepreneur and capital income. The three aspects are mingled in the case of single-worker IHBs or in the presence of unpaid family workers. We also use entrepreneurial profit as an alternative outcome measure for robustness checks (difference between value added and total wage bill and taxes).

Initially, formalized units were performing better than those remaining in the informal sector, and their value added increased much more (Figure 1). The mean annual Value Added was 53,536,150 VND (approximately 2,560 USD) in 2007 for the treated group, significantly different

from the figure of the control units (37,174,680 VND or 1,780 USD). It appears graphically that the distribution was similar among groups near the tails, and that formalized units were initially more concentrated in the higher middle of the income distribution. Between the two years, annual Value Added registered a small increase in nominal terms for the whole sample of informal firms. This evolution was actually entirely driven by the sub-sample of informal units that chose to enter the formal sector: their added value grew (at constant prices) by 45.3% while it remained stable for other IHB. The difference in distribution is thus more pronounced in 2009. Treated units improved their relative performance.

Figure 1. Distribution of annual Value Added - Evolution among treated and control groups



iii. Operating conditions

IHB that formalized had significantly more often access to water (37% *vs.* 53%), electricity (62% *vs.* 79%), phone (40% *vs.* 61%) and mobile phone (20% *vs.* 39%). This gap worsened after the treatment in some cases. Both groups were significantly different in terms of premises in 2007 (39% of controls operating outside *vs.* 17% of treated only) and accounts (28% *vs.* 45% keeping formal accounts), but were comparable in terms of size (1.51 and 1.66 workers, respectively) (see Table 3).

Table 3. Intermediate outcomes by treated and control observations

	2007			2009		
	Still informal (Controls)	Formalized (Treated)	P-value	Still informal (Controls)	Formalized (Treated)	P-value
Observations	1317	147		1317	147	
<i>Variables A. Equipment</i>						
Water	0.37	0.53	0.000	0.35	0.57	0.000
Electricity	0.62	0.79	0.000	0.57	0.87	0.000
Phone	0.40	0.61	0.000	0.38	0.64	0.000
Mob. Phone	0.20	0.39	0.000	0.44	0.66	0.000
Internet	0.01	0.03	0.108	0.03	0.12	0.000
<i>Variables B. Scale of operation</i>						
Size	1.51	1.67	0.182	1.48	2.05	0.000
Outside prem.	0.39	0.17	0.000	0.38	0.07	0.000
Borrowed	0.09	0.07	0.479	0.08	0.12	0.190
Investment	0.14	0.17	0.486	0.23	0.22	0.879
Bookkeeping	0.30	0.45	0.000	0.30	0.61	0.000
<i>Variables C. Expressed problems</i>						
Supply	0.10	0.11	0.720	0.10	0.15	0.055
Customers	0.24	0.23	0.739	0.25	0.32	0.096
Competitors	0.38	0.33	0.279	0.36	0.44	0.075

Treated observations were already performing better in 2007 in terms of value added, and the gap worsened. Moreover, they were operating with better equipment, less often outside, and were keeping formal accounts more often. The specificities of the formalized group, made of initially better-off units, support the idea that the option is not relevant for all businesses.

4. Identification strategy, results, and discussion

In a first stage, we evaluate the impact of transition on performance, measured by annual value added. These results can be compared -and are consistent- with those obtained by Rand & Torm (2012), and to a certain extent to the ones of McKenzie & Sakho (2010). In a second step, we investigate more deeply the channels through which these effects occur by estimating the impact of formalization on the firms' condition of operation: access to equipment (water, electricity, phone, internet), scale of operation (size, premises, probability to borrow or invest in the past 12 months, type of accounts), and intensity of competition (problems with suppliers, customers, competitors).

The qualitative surveys gave insights into how newly formalized HBs could benefit directly from their status. Some of them mentioned a facilitated relation with their suppliers and customer, or an easier access to new markets:

– “*Formality helps your business to develop because you don't have to conceal your work*” (a supplier of clothes for supermarkets in HCMC).

– “*As I wish to co-operate with SaigonCoop, I have to be able to present legal invoice. Only then, they (SaigonCoop) are willing to work with me*” (a small clothing retailer who registered her business so that she could join a supermarket chain).

– “*Since I transformed my business, it saw an improvement in performance. With my current legal status, I can sign contracts with other parties. My customer base now includes more enterprises than households*” (an air conditioner repairer and seller).

1. Impact of formalization on final outcomes

Our purpose in this first section is to estimate the causal effect of formalization on outcome measured by the annual Value Added. We rely on the 147 units of our panel that were operating informally in 2007 and became formal before 2009, and compare this treated group with the control group of 1,317 businesses that remained informal. We denote Y the outcome of interest, F a dummy variable representing the treatment (getting registered), t a time dummy, and X the set of control variables. To measure the effect of formalization on outcome controlling for other covariates, we first run the following regression to obtain double-difference estimates:

$$Y_{it} = \beta_0 + \beta_1 t_{it} + \beta_2 F_{it} + \beta_3 (F_{it} * t_{it}) + \beta_4 X_{it} + \varepsilon_{it} \quad (1)$$

The effect we want to estimate is then β , coefficient of the interaction term between time and treatment. These regressions are simple and easily implementable by parametric methods to evaluate the impact of interest, but have several obvious limitations.

First, the parametric specification of the outcome is supposed to be linearly dependent on the covariates. The unobserved residual has allegedly an additive and separable form. Thus, even if one has a complete and relevant set of control variables, the estimated average effect of the treated (ATT) will be biased if the real specification of the interest variable is not linear. Secondly, it is sensitive to the distribution of covariates among treated and non-treated, since it is based on a linear extrapolation to build a counterfactual.

The second DiD specification introduces fixed effects (FE) in order to control for endogeneity linked to time-invariant unobservable factors, such as head's ability and degree of compliance with regulation. We denote the individual fixed effect β and re-write the previous model:

$$Y_{it} = \beta_{0i} + \beta_1 t_{it} + \beta_2 F_{it} + \beta_3 (F_{it} * t_{it}) + \beta_4 X_{it} + \varepsilon_{it} \quad (2)$$

Table 4 presents difference-in-difference estimates of the effect of formalization on the log of annual value added, using DiD-OLS and DiD-FE specifications. We progressively include the two groups of control variables related to production units' characteristics (city, time in business and industry), and then to heads' characteristics (sex, migration, age and proxies for abilities: education and motivation). Our interaction variable of time and formalization has a constant positive effect on our performance measure, ranging from 21% to 22%. It is significant at the 10% level when using DiD-OLS, and 5% when including DiD-FE. We obtain the same magnitude of coefficients with both specifications, which indicates that selection on time-invariant unobservable factors is limited.

Table 4. Effect of formalization on performance for the whole sample: (DiD) OLS and FE

	(1)	(2)	(3)	(4)	(5)	(6)
	DiD-OLS	DiD-OLS	DiD-OLS	DiD-FE	DiD-FE	DiD-FE
<i>Controls</i>	<i>none</i>	<i>IHB char.</i>	<i>all</i>	<i>none</i>	<i>IHB char.</i>	<i>all</i>
Time	0.346*** (0.0389)	0.330*** (0.0399)	0.300*** (0.0387)	0.346*** (0.0293)	0.372*** (0.0356)	0.367*** (0.0358)
Treated	0.415*** (0.0839)	0.457*** (0.0837)	0.340*** (0.0800)			
Formalization (T*t)	0.209 (0.128)	0.209 (0.127)	0.217* (0.125)	0.209** (0.101)	0.212** (0.1000)	0.210** (0.101)
<i>Controls A. IHB Characteristics</i>						
City: Hanoi		0.0957** (0.0372)	0.0741* (0.0399)			
		<i>IHB duration ref: 0-3 years</i>				
3-10 years		0.0591 (0.0457)	0.0716 (0.0447)		-0.0415 (0.0646)	-0.0366 (0.0651)
>10 years		0.0465 (0.0554)	0.147*** (0.0552)		-0.283** (0.136)	-0.285** (0.137)
		<i>Industry ref: manufacture</i>				
Trade		-0.442*** (0.0586)	-0.324*** (0.0565)		-0.248 (0.244)	-0.247 (0.237)
Services		-0.287*** (0.0537)	-0.224*** (0.0513)		0.0258 (0.236)	0.0257 (0.228)
Controls: head char.		No	Yes		No	Yes
Constant	9.988*** (0.0269)	10.18*** (0.0602)	9.838*** (0.0802)	10.03*** (0.0140)	10.17*** (0.187)	10.08*** (0.236)
Observations	2,928	2,928	2,928	2,928	2,928	2,928
R-squared	0.056	0.080	0.146	0.108	0.113	0.122
Number of id				1,464	1,464	1,464
Dependant variable: log of annual Value Added						
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

OLS and FE DiD estimators rely on the common trend assumption (treated and untreated would have followed parallel paths in the absence of treatment), which is not completely plausible if initial characteristics explaining the changes in performance are unbalanced between the treated and the untreated. Therefore, the next step of the identification strategy to reduce selection bias is to apply DiD matching estimators in order to rebuild acceptable counterfactuals. DiD-ME have been shown by Smith & Todd (2005) to perform best among the different matching methods.

Table 5 presents the results of the DiD-ME of the effect of registration on annual value added. Three types of DiD-ME are computed. The first one consists in reweighing the observations by

the odds-ratio of the score estimated in the first step, while restricting to common support. The two others are nearest neighbours with 4 units (NN) and propensity score matching (PS). Inference with matching estimators is problematic: standard errors are underestimated because of failing to take into account that the score is estimated in the first place. In addition, Abadie & Imbens (2006a, 2006b) demonstrated that bootstrap is not valid for inference in this case. Therefore, the reported standard errors (s.e.) in the case of reweighting and radius matching constitute lower bounds of the real values. We provide consistent s.e. in the case of nearest neighbours matching estimators with replacement, as in Abadie & Imbens (2006b).

Table 5. Effect of formalization on performance: (DiD) matching estimates

	(A) Reweighting	(B) Nearest neighbour (4)	(C) PS matching
Coefficient	0.209**	0.193*	0.204**
s.e.	0.102	0.107	0.100
<i>90 non treated units are off common support</i>			
*** p<0.01, ** p<0.05, * p<0.1			

This additional specification confirms the overall positive impact on performance, the estimated coefficient being in the same range as the previous specifications. However, the huge heterogeneity of informal sector businesses may lead to contrasted results. Subsistence small businesses operate alongside bigger units escaping regulation, and both types may have contrasted motivations for registration -and thus face different consequences. As in McKenzie & Sakho (2010) we chose to integrate this possibility by splitting the sample between sown-account workers and the rest of units initially including at least one worker (roughly half of the treated observations).

The coefficient of the effect of formalization on annual value added for our specifications is reported in Table 6. The first two models use a DiD-OLS setting including firstly the control variables of head's characteristics only, and secondly the HB characteristics as well. Models 3 and 4 do the same with DiD-FE, and finally columns 5 and 6 present the results for matched double differences (reweighting and Nearest Neighbours). It appears that our previous results were driven by initially bigger businesses (those having at least one employee). While the effect becomes non-significant for sub-sample of initially single-worker firms in all models, it ranges from 35% to 48% for those having initially one or more workers in addition to the head.

Table 6. Effect of formalization on performance: results by initial size of the business

	(1)	(2)	(3)	(4)	(5)	(6)
	DiD-OLS	DiD-OLS	DiD-FE	DiD-FE	DiD-ME:	DiD-ME:
	Controls:	Controls:	Controls:	Controls:		
	Head's char.	all.	Head's char.	all.	reweighting	NN
Own-account workers	0.147 (0.153)	0.154 (0.155)	0.136 (0.152)	0.147 (0.137)	0.0841 (0.138)	0.068 (0.146)
1+ employee	0.349* (0.197)	0.347* (0.190)	0.393** (0.189)	0.349** (0.150)	0.478*** (0.146)	0.458*** (0.163)

The results corroborate the idea that the smallest businesses do not benefit directly from registration in terms of performance. Their initial amount of capital may be too small—and the credit constraint too strong—to allow them to make the necessary investments. This result supports the views of McKenzie & Woodruff (2006) for whom formality is potentially irrelevant for many micro-enterprises. Many IHBs consisting only of own-account workers never grow large enough to need the institutions to which formality gives access, while they support direct costs of registration and increased competition.

While interpreting these results, one should bear in mind that between the two rounds of the panel a major macroeconomic crisis occurred that affected the Vietnamese economy, dividing the growth rate by 2. Even if the hardest part of the crisis was already behind at the time of the second survey, it is not impossible that the performance of formal HB was more affected than that of IHB—due to lower flexibility—, leading to underestimate the effect of formalization. Applying the same evaluation process within another macroeconomic context might show that registration has an even more characterized effect on performance. Furthermore, the nature of the data does not allow taking directly into account the time elapsed between the business registration and the outcome measured. The impact of formalization on performance has no reason to be constant over time and could be under-evaluated if a large share of HB registrations occurred too closely before the second survey.

It should also be noted that putting together the two major cities of our sample in a DiD setting disregards their structural differences, and that the sample size does not enable us to conduct the whole analysis separately for the capital city (Hanoi) and the southern metropolis²⁵ (Ho Chi Minh City). Nonetheless, estimating the global impact separately shows that businesses in both

²⁵ This does not reflect the personal opinion of the authors, who do not take sides in this eternal debate, but rather the findings of the “Viet Nam Provincial Governance and Public Administration Performance Index” available at <http://papi.vn/>.

cities followed differentiated patterns. The better environment of Ho Chi Minh City in terms of infrastructures, public service delivery and institutions appeared to be creating stronger benefits of formalization than in Hanoi. This corroborates the positive correlation between local institutions and formality found in Malesky & Taussig (2009).

2. Impact of formalization on intermediate variables: does it change Household Businesses conditions of operation?

Estimating a plausibly causal impact on the overall performances when businesses leave the informal sector does not tell much about the mechanisms at stake. One of the main contributions of this paper is to check a series of hypotheses on these potential channels.

Tables 7–9 show the effect of formalization on a set of intermediate outcomes representing businesses' conditions of operation. The same methodology is applied, using dynamic specifications (1), (2), and (3). All intermediate outcomes of interest (except size) are modelled as dummy variables. Therefore, OLS and FE specifications are estimated as linear probability models (LPM), whose usual limitation (to produce unbounded results that may be outside the correct interval) does not apply in a DiD setting.

Table 7. Impact of formalization on equipment

	Water	Electricity	Phone	Mob. Phone	Internet
<i>DiD-OLS</i>					
Controls: head char.	0.0367 (0.0606)	0.108** (0.0489)	0.0243 (0.0591)	0.0234 (0.0551)	0.0729** (0.0295)
Controls: all	0.0383 (0.0594)	0.105** (0.0484)	0.0219 (0.0578)	0.0237 (0.0550)	0.0732** (0.0294)
<i>DiD-FE</i>					
Controls: head char.	0.0443 (0.0487)	0.121*** (0.0403)	0.0336 (0.0514)	0.0237 (0.0491)	0.0732*** (0.0274)
Controls: all	0.0411 (0.0490)	0.118*** (0.0407)	0.0282 (0.0520)	0.0225 (0.0494)	0.0732*** (0.0275)
<i>DiD-ME</i>					
(A) Reweighting	0.0389 (0.0496)	0.120*** (0.0411)	0.0367 (0.0517)	0.0102 (0.0503)	0.0740*** (0.0276)
(B) Nearest neighbor (4)	0.0541 (0.055)	0.164*** (0.0442)	0.0349 (0.0544)	-0.0424 (0.0518)	0.064** (0.0289)
(C) PS matching	0.0776 (0.0525)	0.155*** (0.0435)	0.0372 (0.0560)	-0.0093 (0.0497)	0.067** (0.0273)

Robust standard errors in parentheses

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

Table 8. Impact of formalization on scale of operation

	Size	Outdoor Premises	Borrowed money	Invest	Bookkeeping
<i>DiD-OLS</i>					
Controls: head char.	0.387** (0.156)	-0.0575 (0.0435)	0.0448 (0.0354)	-0.0253 (0.0480)	0.152** (0.0593)
Controls: all	0.383** (0.152)	-0.0522 (0.0438)	0.0445 (0.0353)	-0.0264 (0.0475)	0.144** (0.0580)
<i>DiD-FE</i>					
Controls: head char.	0.396*** (0.103)	-0.0728** (0.0336)	0.0484 (0.0341)	-0.0309 (0.0457)	0.160*** (0.0508)
Controls: all	0.388*** (0.102)	-0.0679** (0.0339)	0.0481 (0.0343)	-0.0258 (0.0452)	0.152*** (0.0508)
<i>DiD-ME</i>					
(A) Reweighting	0.403*** (0.103)	-0.0550 (0.0350)	0.0466 (0.0349)	-0.0153 (0.0436)	0.128** (0.0523)
(B) Nearest neighbor (4)	0.383*** (0.113)	-0.0891** (0.0378)	0.0414** (0.0366)	-0.0170 (0.0514)	0.0914* (0.0538)
(C) PS matching	0.424*** (0.109)	-0.0935** (0.0391)	0.0427 (0.0372)	-0.0229 (0.0486)	0.125** (0.0495)
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1					

Table 9. Impact of formalization on declared problems

	Supply	Customers	Competitors
<i>DiD-OLS</i>			
Controls: head char.	0.0440 (0.0405)	0.0730 (0.0544)	0.122** (0.0591)
Controls: all	0.0416 (0.0402)	0.0700 (0.0541)	0.121** (0.0578)
<i>DiD-FE</i>			
Controls: head char.	0.0466 (0.0415)	0.0722 (0.0536)	0.119** (0.0587)
Controls: all	0.0423 (0.0414)	0.0673 (0.0538)	0.114* (0.0586)
<i>DiD-ME</i>			
(A) Reweighting	0.0323 (0.0416)	0.0752 (0.0544)	0.125** (0.0588)
(B) Nearest neighbor (4)	0.0506 (0.0442)	0.0934 (0.0589)	0.154** (0.0609)
(C) Radius matching	0.0656 (0.0397)	0.084 (0.0511)	0.159** (0.0567)

Robust standard errors in parentheses

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

i. Access to equipment

Building on the view of Levy (2007), the first hypothesis was that leaving the informal sector allows a reduction in the practical constraints that entrepreneurs face in terms of access to adequate production means and public goods. Results (in Table 7) suggest that formalization has a strong and significant effect on access to the types of equipment that (mostly) require legal existence: electricity and Internet. We find that treated units are respectively 12% and 7% more likely to gain access to them between 2007 and 2009 than the control group, depending on the specification.

ii. Scale of operation

The second type of results relates to the often-alleged constraint that informality represents in terms of scale of operation. Operating without a license often means remaining unnoticed. Thus the possibility has been evoked that informality prevents businesses from reaching their optimal size (in particular in Fajnzylber *et al.*, 2011). In order to test the possibility that formalization allows HBs to operate on a larger scale, Table 8 presents the effect of registration on size (discreet variable), probability to have outdoor premises, indicator of having borrowed money (in the past 12 months), to have invested during the same period, and finally probability of keeping written accounts.

Household businesses quitting the informal sector increased their size about 40% more than control IHBs, reaching a medium value of 2.04. This finding confirms the view of Fajnzylber *et al.* (2011). Leaving the informal sector is a condition for businesses to increase their size. An improved performance combined with easier access to production means may encourage businesses' heads to hire more workers. Formalization also decreases the probability of operating outdoors (significant at the 5% level), indicating a better access to professional premises for registered HB. By contrast with Rand & Torm (2012), this is not associated with a higher propensity to borrow or to invest during the same time period. The remaining credit constraints for formalized businesses may have prevented them from accessing sufficient amounts of funding and from investing significantly more. Although focusing on larger firms than our sample, Rand (2007) also found that the biggest formal firms seem to be more credit constrained, "*contrarily to the general perception that financing constraints are more binding for smaller firms*". As they try to

diversify their sources of funding toward more formal channels, our treatment HBs encounter new barriers, which may indicate that informal credit systems are still playing the most important role in financing micro and small enterprises in Vietnam (as in McMillan & Woodruff, 1999). Finally, formalized businesses experience a shift in their management practices. We find a well-determined effect on the probability of keeping written accounts, which is a necessary condition to operate more efficiently on a larger scale and may have an impact on performance by a better use of inputs and improved labour productivity.

iii. Intensity of competition

Finally, we estimate the impact of formalization on the heads' assessment of their environments competitiveness. Our outcome variables are subjective appreciations of their situation. The question is: "*Do you have problems or difficulties in the following domains: supply of raw materials (quantity or quality), sale of your production (lack of customers), sale of your production (too much competition)*". Our results indicate that formalized HB heads do not report more problems with customers or suppliers, but a significantly stronger increase (between 11% and 16%) in reporting problems with competitors.

In order to investigate the reasons why the sub-sample of businesses that were initially own-account workers do not benefit from registration as much as bigger businesses in terms of performance, we computed the effect of registration on the two separated groups (results in appendix table 1). This supports our interpretation of improved conditions allowing in turn increasing economic performance, since the initially smaller businesses do not benefit as much as the employers sample. They do not get better access to electricity, and the effect on size increase is twice as low.

5. Robustness checks: alternative indicators and identification

The following section provides additional robustness checks of the results by answering potential concerns as regards performance measure and definition of formalization, and by looking at complementary identification strategies. We find the impacts to be consistent, although less strong, using a measure of net profits rather than value added. Moreover, when defining formalization as tax registration (instead of business license), we find even more characterized results. We also look at the largely unknown phenomenon of informalization (the dual approach), and find a significant negative effect of leaving the formal sector for the informal sector. Finally, we conducted additional investigations on potential time-variant heterogeneity and reverse causality.

i. Alternative performance measure: impact of business registration on net profits

Our previous measure of performance, based on the difference between turnover and intermediate consumption, integrates at the same time labour, capital, and entrepreneur's incomes. Although relevant when considering businesses' performance as a whole, this concept can be completed by another variable capturing more specifically entrepreneurial profit. Therefore, we subtracted from annual value added the total paid wages and taxes to get a measure of net profits and computed OLS, Fixed-effects and matched double-differences, integrating HB and head's characteristics. Results are provided for the whole sample and for the two sub-samples of own-account entrepreneurs or employers in Table 10.

Table 10. Effect of formalization on net profits: OLS and FE results by size of HB

	<i>Whole sample</i>			<i>OAW</i>			<i>At least one employee</i>		
	OLS	FE	Matching (R)	OLS	FE	Matching (R)	OLS	FE	Matching (R)
Formalization (T*t)	0.187 (0.125)	0.179* (0.102)	0.174* (0.103)	0.0973 (0.150)	0.0824 (0.138)	0.0460 (0.136)	0.343* (0.199)	0.338** (0.148)	0.430*** (0.150)
Observations	2,928	2,928		1,990	1,990		938	938	
Number of id		1,464	1,419		996	956		469	453

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Taking the whole population of formalized HBs, the effect remains significant at the 10% level when accounting for observed and unobserved time-invariant heterogeneity. HB that chose to register increased their net profits by 17% more than those remaining informal. The impact is slightly lower than for the value added. Two reasons may directly explain this. On the one hand,

business registration is likely to imply more frequent and higher tax payment. The proportion of tax-paying formalized units reached 77%, while the initial figure was equal to the one of the control group (42%) for which it remained stable. On the other hand, formalization may imply increased labour costs for the HB while hiring more (and more productive) workers. The cost of manpower can rise because of the higher number of employees, higher individual wages, and also because of an increased unit cost of having to comply with regulations. This result is noticeably in line with Rand & Torm (2012) who document a decrease in the use of casual labour while formalizing.

As in the core analysis, the whole difference of performance is concentrated on HBs that had at least one employee in 2007 with an impact of 34% while the difference is not significant for initially own-account entrepreneurs. The already non-significant effect on the OAW may disappear because of the tax burden. Both increased taxes and higher cost of salaries explain the slight reduction of the impact on the employers' population. The wage bill increased twice as much for the treated group. Overall, it should be stressed that the significant effect found on net profits means that even if formality implies more taxes and a higher wage bill, the increase is not sufficient to make it unprofitable.

ii. Formalization and registration: is the operational definition relevant?

The statistical definition of informal sector by the ILO (1993) based on non-registration left room for manoeuvre for countries to select the criterion to define informality. In the core analysis we chose the business license register to stay in line with the literature on informality in Vietnam. However, other types of registration may be considered. We reproduced our estimations with the alternative definition of tax registration instead of a business license. The two criteria are supposed to be highly correlated (in particular because a business license is virtually mandatory to register for tax), but we find in our sample that among the 133 units that performed tax registration between the two years, only 85 registered for a business license as well (while 49 registered only for taxes).

Tables 11 and appendix table 2 reproduce the analysis with this alternative definition of formalization; we focus on the sample of units that were not registered for tax payment in 2007. We compare the 133 observations that fiscally registered with the 1,405 observations that did not. Table 11 provides OLS, FE, and ME DiD estimates of the effect of tax registration on performance (measured as annual value added). We find a significant (at 1% level) and strong effect, as treated units increased their performance 35% more than the control group, which

confirms that the previous results were not sensitive to the choice of the operational definition. Regressions on the two separated sub-samples of OAW and employers (results not reported) show a similar pattern with the previous results. The effect is in fact mainly driven by the biggest units, even if it is partly significant for OAW.

Table 11. Effect of tax registration on annual value added

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DiD-OLS	DiD-OLS	DiD-OLS	DiD-FE	DiD-FE	DiD-FE	DiD-ME	DiD-ME
<i>Controls</i>	<i>none</i>	<i>IHB char.</i>	<i>all</i>	<i>none</i>	<i>IHB char.</i>	<i>all</i>	<i>Reweighting</i>	<i>NN</i>
Formalization (T*t)	0.345** (0.136)	0.353*** (0.134)	0.331** (0.131)	0.345*** (0.104)	0.346*** (0.104)	0.339*** (0.105)	0.373*** (0.102)	0.350*** (0.097)
Observations (<i>id</i>)	3,076	3,076	3,076	3,076	3,076	3,076	1,485 <i>id</i>	1,485 <i>id</i>
R-squared	0.075	0.098	0.160	0.114	0.117	0.124		

Dependant variable: log of annual Value Added
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix table 2 presents the estimated effect of tax-registration on our measures of conditions of operation. Previous results are confirmed and appear to be even stronger with the alternative definition. Tax registration is associated with a 60% increase in size (*versus*. 41% with business license). This could reflect the fact that obtaining a tax code is a stronger commitment than a business license, and/or that law-enforcement might be stronger when it comes to tax registration. The probability of operating outdoors is also significantly (at 1%) reduced.

iii. The Dual approach: the effect of informalization on originally registered businesses

Alongside the units of our panel that chose to formalize, many of the already registered businesses chose to enter the informal sector, which played a buffer role in a time of economic downturn. This phenomenon was not marginal. 122 units that were originally formal chose to informalize (see Table 1). The qualitative interviews conducted with some of these units in 2013 showed that they concretely gave back their license (while still operating) in the hope of avoiding paying tax and gain flexibility. This phenomenon interestingly completes the previous analysis as it can be conceived as its dual approach. We expect to find a negative effect of informalization on performance. Appendix table 3 provides the coefficient of this new treatment variable (entering the informal sector, for originally formal businesses) compared to the control group of formal

HBs that remained registered. It is to our knowledge the first measurement of the impact of informalization for already existing formal HBs. Applying the same methodology to control for selection into treatment, we find that informalization has a significant negative impact on performance, reducing Value Added by 33-45%. It also significantly decreases the probability of accessing equipment, keeping formal accounts, and operating in fixed premises.

iv. Threats to causality

Although the specifications used in the core of the paper tackled most of the endogeneity issues (selection on observables and unobserved time-invariant heterogeneity), they call for further investigation in order to address two additional concerns.

First, unobserved time-varying factors might affect performance as well as registration. We are only able to check what seemed to be the main potential source: the changes in local policies or economic environment that would affect the decision to formalize as well as the businesses' operations only for some localities. To do so, we used complementary data by matching our observations in the corresponding 2007 and 2009 Labour Force Surveys. Then, we computed the proportion of registered businesses -excluding our observations- at the smallest possible local level (the Enumeration Area) for both years. If, for some reason, a specific enumeration area underwent a change in the attitude of local authorities towards stronger law-enforcement for instance, this would be reflected in the change of the proportion of *other* (than the observations) registered businesses. So we checked if an increase in the proportion of formal businesses in the Enumeration Area has a positive effect on the individual probability to formalize. Taking the formalization variable as outcome, we used our three DiD specifications, including a dummy variable to indicate an increase in the proportion of formal Household Businesses in the EA, and controlling for the same set of heads' and businesses' characteristics. The dummy variable considered, which can characterize changes of local policies or an improvement in the economic environment at a very local level, does not have a positive impact on the probability of registration (the coefficients even happen to be negative). Therefore, this specific potential endogeneity bias can be set aside, although the existence of other time-variant unobserved factors cannot be really excluded.

The second concern is the reverse causality issue. If increased performances cause HB to register their activity, the impact we measured would be a mere correlation between the events

“expanding one’s business” and “becoming formal” rather than a proper impact of quitting the informal sector. It should be stressed that if existent, such simultaneity would be only marginal since the nature of our data implies that formalization occurred, in any case, before the change (increase or decrease) in performance. We nevertheless generated a dummy variable identifying the HBs whose value added grew in real terms (given the economic context, this concerned only 55% of the sample). Regressing this “increased performance” dummy on the probability to formalize yielded no significant result, using the same dynamic specifications as above.

6. Conclusion

In this paper, we addressed two policy-relevant questions on informality: do IHBs gain by formalizing (and how much), and through which channels those gains may occur. We first showed that the HBs that decided to register are a specific population, characteristics of which were already close to the ones of formal HBs. We therefore support the view expressed (among others) by McKenzie & Woodruff (2006) that not all production units in this sector have a vocation to register. Many of them are subsistence activities, for which the point of getting a business license is not even raised. For some others though (mainly the intermediate and “professional” types in the terminology of Cling *et al.*, 2010) the question is relevant, and the benefits and mechanisms of leaving the informal sector for the business themselves were unclear so far.

Second, formalized HBs benefit from improved conditions of operation. Using a DiD specification, we showed that registration facilitates accessing new equipment (electricity and internet) and operating on a larger scale (increase size, access indoor premises and keep written accounts). We also find it to be associated with a more competitive environment. Overall, businesses are more efficient when escaping the constraints associated with informality.

Finally, this ability to operate on a larger scale in a more competitive environment and to use better equipment increases the formalized businesses’ performances. We estimate the impact of formalization on performance to be at least 20% on annual value added, and 17% on net profits.

All of the above results are strongly differentiated by the initial size of our HBs. Own-account workers who registered did not improve their operating conditions or performance significantly. A certain threshold of size is probably necessary to benefit from legal existence and access to public goods.

These results have important policy implications, since encouraging formalization is often advocated for. First, it should be acknowledged that the group of more precarious informal HBs, whose justification is mainly subsistence, is unlikely to follow a trend of formalization as they have no interest in doing so. Since they constitute a huge part of many developing economies, they should however not be deprived of the regulator’s attention, and should benefit from specifically targeted programs aiming at improving their operating conditions (Cling, Razafindrakoto, & Roubaud, 2014a). The current policy seems to be the opposite in Vietnam. A

law voted since 2008 tends to prohibit itinerant businesses, which denotes a will to display²⁶ the face of a modern emerging city (Cling, Razafindrakoto, & Roubaud, 2014b, chap. 15) at the expense of informal sector workers. Second, for businesses that are concerned by the possibility of registration, encouraging it is relevant since it is likely to improve their conditions of operation, and decisions could be taken to enhance the impact on performance and make the choice more attractive.

²⁶ Among the simplest policies to encourage formalization, a low hanging fruit would be to clarify the registration rules and improve information. Descriptive results from the same survey show that almost 90% of businesses are unregistered because they don't know if they have to do so.

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Appendix

Appendix table 1. By which channels does formalization improve performance? Results by initial size

	Whole sample		OAW		At least one employee	
	DiD-OLS	DiD-FE	DiD-OLS	DiD-FE	DiD-OLS	DiD-FE
Access to equipment						
Water	0.0383 (0.0594)	0.0411 (0.0490)	0.0212 (0.0793)	0.0373 (0.0618)	0.0512 (0.0896)	0.0478 (0.0809)
Electricity	0.105** (0.0484)	0.118*** (0.0407)	0.0753 (0.0693)	0.103* (0.0562)	0.141** (0.0638)	0.159*** (0.0611)
Phone	0.0219 (0.0578)	0.0282 (0.0520)	-0.0349 (0.0778)	-0.0102 (0.0683)	0.0859 (0.0859)	0.0833 (0.0817)
Mob. Phone	0.0237 (0.0550)	0.0225 (0.0494)	0.0919 (0.0706)	0.0982 (0.0625)	-0.0684 (0.0864)	-0.0823 (0.0785)
Internet	0.0732** (0.0294)	0.0732*** (0.0275)	0.0669* (0.0400)	0.0669** (0.0340)	0.0783* (0.0430)	0.0752* (0.0443)
Scale of operation						
Size	0.383** (0.152)	0.388*** (0.102)	0.329*** (0.102)	0.326*** (0.101)	0.713** (0.287)	0.661*** (0.200)
Premises	-0.0522 (0.0438)	-0.0679** (0.0339)	-0.0508 (0.0646)	-0.0797 (0.0506)	-0.0456 (0.0552)	-0.0589 (0.0417)
Borrowed money	0.0445 (0.0353)	0.0481 (0.0343)	0.0656 (0.0487)	0.0739 (0.0450)	0.0248 (0.0528)	0.0359 (0.0543)
Invested	-0.0264 (0.0475)	-0.0258 (0.0452)	-0.0485 (0.0585)	-0.0477 (0.0580)	0.0115 (0.0791)	0.0102 (0.0752)
Bookkeeping	0.144** (0.0580)	0.152*** (0.0508)	0.146* (0.0759)	0.164** (0.0701)	0.146 (0.0896)	0.135* (0.0733)
Declared problems						
Supply	0.0416 (0.0402)	0.0423 (0.0414)	0.0956* (0.0511)	0.0961* (0.0532)	-0.0104 (0.0654)	0.00219 (0.0670)
Customers	0.0700 (0.0541)	0.0673 (0.0538)	-0.0175 (0.0716)	-0.0225 (0.0732)	0.213** (0.0838)	0.239*** (0.0759)
Competitors	0.121** (0.0578)	0.114* (0.0586)	0.0988 (0.0776)	0.101 (0.0840)	0.164* (0.0864)	0.157* (0.0836)
Observations	2,928	2,928	1,990	1,990	938	938
Treated	294	294	166	166	296	296
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Appendix table 2. Effect of tax registration on conditions of operation

Controls:	DiD-OLS		DiD-FE		DiD-ME
	Head	all	Head	all	(Reweighting)
<i>Access to equipment</i>					
Water	0.0529 (0.0633)	0.0489 (0.0615)	0.0656 (0.0550)	0.0673 (0.0549)	0.0830 (0.0534)
Electricity	0.0793* (0.0464)	0.0737 (0.0465)	0.0946** (0.0378)	0.0955** (0.0382)	0.107*** (0.0387)
Phone	0.158** (0.0615)	0.161*** (0.0596)	0.174*** (0.0486)	0.179*** (0.0489)	0.199*** (0.0479)
Mobile Phone	0.0703 (0.0577)	0.0729 (0.0577)	0.0777 (0.0491)	0.0800 (0.0490)	0.0875* (0.0494)
Internet	0.141*** (0.0392)	0.141*** (0.0388)	0.145*** (0.0334)	0.146*** (0.0334)	0.147*** (0.0326)
<i>Scale of operation</i>					
Size	0.569** (0.228)	0.565** (0.222)	0.603*** (0.116)	0.607*** (0.117)	0.607*** (0.121)
Premises	-0.0627 (0.0426)	-0.0567 (0.0436)	-0.0788*** (0.0275)	-0.0766*** (0.0275)	-0.0746*** (0.0282)
Borrowed money	0.0506 (0.0405)	0.0497 (0.0405)	0.0503 (0.0354)	0.0496 (0.0354)	0.0562 (0.0348)
Invested	-0.0674 (0.0508)	-0.0791 (0.0496)	-0.0704 (0.0476)	-0.0704 (0.0473)	-0.0584 (0.0458)
Bookkeeping	0.138** (0.0600)	0.136** (0.0594)	0.158*** (0.0530)	0.154*** (0.0526)	0.138** (0.0536)
<i>Intensity of competition</i>					
Supply	-0.0150 (0.0474)	-0.0151 (0.0470)	-0.0166 (0.0478)	-0.0185 (0.0473)	-0.0341 (0.0454)
Customers	0.0828 (0.0595)	0.0830 (0.0599)	0.0849 (0.0584)	0.0842 (0.0586)	0.0744 (0.0585)
Competitors	0.128** (0.0634)	0.131** (0.0635)	0.129** (0.0587)	0.129** (0.0584)	0.119** (0.0583)
Observations	3,076	3,076	3,076	3,076	3,076
Treated	133	133	133	133	133
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Appendix table 3. Effect of informalization on HB performances and operating conditions

	DiD-OLS	DiD-FE	DiD-ME (Reweighting)
Value added	-0.332** (0.134)	-0.333*** (0.102)	-0.450*** (0.105)
<i>Access to equipment</i>			
Water	-0.0745 (0.0689)	-0.0817 (0.0575)	-0.120* (0.0709)
Electricity	-0.0942* (0.0482)	-0.0902** (0.0352)	-0.0998*** (0.0385)
Phone	-0.161** (0.0648)	-0.168*** (0.0536)	-0.210*** (0.0577)
Mobile Phone	-0.161** (0.0670)	-0.175*** (0.0642)	-0.163** (0.0711)
Internet	-0.124*** (0.0379)	-0.122*** (0.0342)	-0.0846*** (0.0324)
<i>Scale of operation</i>			
Size	-0.289 (0.225)	-0.287** (0.132)	-0.146 (0.198)
Premises	0.154*** (0.0466)	0.150*** (0.0357)	0.177*** (0.0412)
Borrowed money	-0.0206 (0.0415)	-0.0146 (0.0402)	-0.0296 (0.0428)
Invested	0.0829* (0.0495)	0.0903* (0.0485)	0.0721 (0.0659)
Bookkeeping	-0.121* (0.0671)	-0.117* (0.0633)	-0.156** (0.0732)
<i>Intensity of competition</i>			
Supply	-0.0192 (0.0541)	-0.00342 (0.0530)	0.0506 (0.0619)
Customers	-0.0292 (0.0667)	-0.0269 (0.0619)	0.0143 (0.0799)
Competitors	-0.109 (0.0713)	-0.115* (0.0682)	0.0135 (0.0807)
Observations	1,038	1,038	1,038
Treated units	122	122	122
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Chapter 2

Health Shocks and Permanent Income Loss: the Household Business Channel

Abstract

This study uses an original Vietnamese panel data to provide strong evidence that microenterprises are vulnerable to health shocks affecting their operators and/or other household members. Although intra-household labour reallocation mitigates the direct labour supply decrease, large out-of-pocket health expenditures have the potential of crowding out business-related expenditure, and to significantly decrease investment. The costs associated with illness thus affect directly the household businesses that generate income for countless individuals around the developing world. These results have important implications, among which the underestimation of the positive externalities of health insurance schemes.

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1. Introduction

Impoverishment due to catastrophic health expenditure is frequent in contexts where health insurance schemes are weak or non-existent. A large body of academic research identifies the effects of health shocks on households' (HH) consumption and coping strategies. Yet, a piece is still missing for the full understanding of the income loss that may occur: do health shocks have a direct impact on the household businesses (HB), which are the main income source for many near-poor households? This study provides robust evidence that health shocks can have large negative effects on household businesses' level of activity and investment. These results imply, in turn, a decrease in the household's capacity to generate income. They can thus be understood as shedding light upon a new channel of impoverishment in case of health shocks: a household business channel.

Discussing the effect of "health problems" involves gathering a set of heterogeneous events under a common terminology. A common and evident feature of these events is a diminished physical (or mental) condition that can impact daily activity. In the case of household businesses, a population that includes self-employed informal sector workers, this impact can directly translate into reduced income. As illustrated by the results of field interviews conducted in Ho Chi Minh City in the last quarter of 2013 among informal sector workers:

"I live from hand to mouth. When I'm sick, I don't get any money: I have to rest. Look: today, my legs hurt, so I can't go" (A recyclable waste gatherer).

These illnesses or injuries have contrasted effects depending on their nature, on their interactions with other pre-existing conditions, and on the context in which they occur. First, different forms of illness or injuries obviously result in different physical or mental conditions. Malaria, tuberculosis, hypertension or rheumatism: all reduce individuals' fettle; yet, they differ in terms of life threat, type and extent of abilities affected, psychological distress, treatment options, and associated financial burden (Lucas, Ding & Bloom, 2008). Second, a health problem can be more or less exogenous, depending on whether it is purely the result of a *shock*, or the manifestation of a chronic disease or poor health. A poorer health status generates more frequent illnesses, and illness (especially if not treated) might also engender complications, risky behaviours or other illnesses. Health problems are thus rarely exogenous, and interact with each other:

“I have rheumatism. [Mrs Cuc] doesn’t want me to drink. But I have this leg problem: I drink to lie down and forget the pain” (The same recyclable waste gatherer).

Third, different contexts contribute to the heterogeneity of effects of otherwise comparable health problems. The age, gender, and income of the individual; the characteristics of the household, such as size, age structure, and its financial and social resources; environmental or economic factors; the availability and characteristics of health facilities as well as the contingency of health insurances schemes: all these elements shape different responses to a similar health problem (Lucas, Ding & Bloom, 2008.). Income, in particular, will determine the probability and the efficiency of treatment following a health problem, efficiency of which is not certain (Sepehri *et al.*, 2008; de Walque *et al.*, 2011).

“I don’t go to the hospital; I only take medicines that people tell me to. My friend recommend me a brand, or I take Chinese and western medicines. But it’s weak and I don’t feel better” (A sticky rice vendor).

Analysing the consequences of such heterogeneous events thus requires particular care in the type of events considered (section 3.ii.), the endogeneity problems, and the factors controlled for (section 4). One can expect those consequences from the perspective of the HB to be of two types: time and money. Whether health problems are treated or not, time costs will be significant (Sauerborn *et al.*, 1996). Not only does the time available for work diminishes, but other healthy household members might also have to devote additional time to caregiving.

“My kids would take care of me. My son helps me with money, my daughter helps feeding me.” (The same sticky rice vendor)

Time costs, in the case of medium or large enterprises, concern a small share of the labour input only. In the case of microenterprises, relying on a single own-account worker in most cases, the decrease in labour input can be much more significant from the *firms’* perspective. Intra-household labour substitution, that is, the reallocation of tasks among HH members, can compensate for labour lost to illness. But complete compensation is not always possible. The ability to reallocate the tasks of the ill individual to other members depends on the household’s size and composition, and on the degree of specialization of the task. Even for what is considered unskilled labour, replacement may be impossible:

“I deliver food and no one can do it for me. Even when I am sick, I have to go and deliver for the regular customers; then I can rest” (A motorbike-taxi)

“If you are sick you cannot work. For someone to replace you he has to know the customers, or it’s impossible. You don’t get any help” (A mobile ice vendor)

Monetary costs are the other expected channel of influence of health problems on household businesses. Both direct and indirect costs are prompted in the short run (McIntyre *et al.*, 2006). First and foremost, the financial burden associated with the treatment can represent a large share of the household’s budget. To the direct and immediate costs of the contingent consultations and treatments (which accounts for a variable share of the total cost of illness, from 30 to 60%; Asenso-Okyere, & Dzator, 1997) are added transportation costs to the health facility (Nahar & Costello, 1998; Attanayake *et al.*, 2000), and other indirect expenditures such as specific food (Nguyen *et al.*, 2012b). In countries where public health systems are underfunded, substantial “unofficial” payments or gifts may also augment indirect costs²⁷ (Balabanova & McKee, 2002; Nguyen *et al.*, 2012a). Perhaps contrarily to intuition, inpatient treatments are not the sole item causing large expenditures: aggregated outpatient treatments and medicines can account for half of total health payments (Lieberman & Wagstaff, 2009). Health insurance coverage is a discriminating factor when it comes to facing these costs, but is often at embryonic stages in developing countries, especially regarding the coverage of the informal sector. Even when it exists and functions, indirect costs are generally not covered. Out-of-Pocket (OOP) payments are thus the main financing source of health care over the developing world, especially in Asia (O’Donnell *et al.*, 2008). A key question is the extent to which these OOP payments affect the household, and more specifically the extent to which they might be considered *catastrophic* in relation with the household’s budget. Above a certain level, health expenditure is “*likely to force households to cut their consumption of other minimum needs, trigger productive asset sales or high levels of debt, and lead to impoverishment*” (Russell, 2004). Borrowing is common to meet these costs, and households resorting to loans can experience lasting effects on livelihoods: interest rates reach high levels,²⁸ and HH remain in debt for a long time after the initial health event.

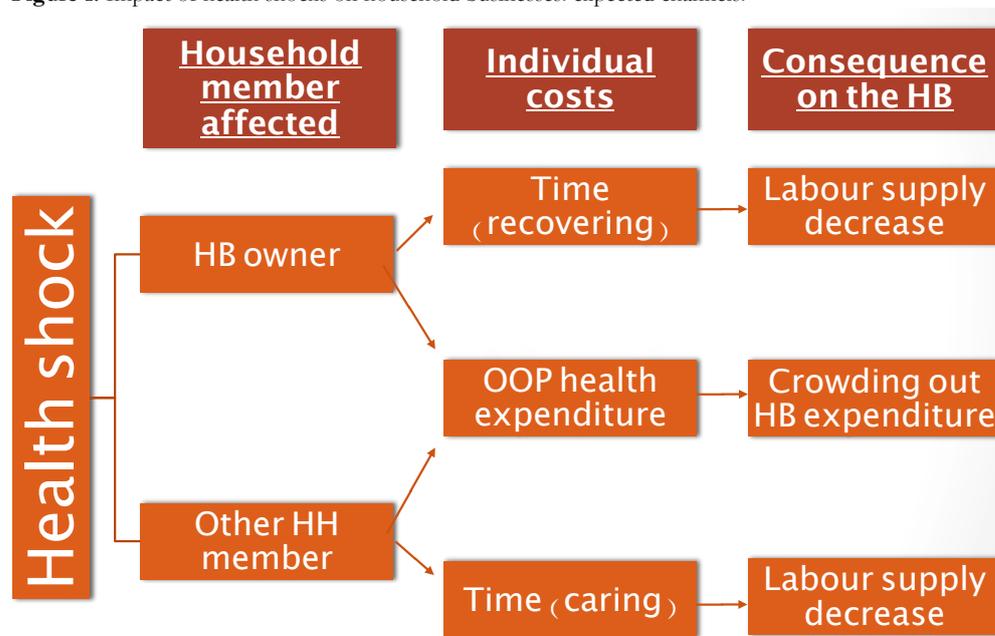
²⁷ It is notoriously the case in Vietnam. Even when accessing healthcare does not require immediate additional fees, they can rarely be avoided since they are then requested for “services” as simple as not sharing a bed with another patient.

²⁸ They were measured between 2.5 and 15% *per month* in Cambodia, where even relatively modest OOP health expenditures lead to poverty through indebtedness (Van Damme *et al.*, 2004)

“I was so sick, I had to borrow 50 million, the interests are 40.000 per day. I had to mortgage the house” (A recyclable waste gatherer).

Watermarked in these monetary and time costs is the idea that the whole household is affected when a member experiences a health problem. The monetary costs are often shared, and time costs can be of comparable amplitude for healthy and for ill members (Sauerborn, Adams & Hien, 1996); the former meet the demand for care giving of the latter (Beegle, 2005; Yamano & Jayne, 2004). Negative impacts can further be amplified by spillovers within the household (d’Adda *et al.*, 2009), noticeably between children and parents. The following analysis thus considers not only health problems of the HB owner, but also those of other household members. Figure 1 summarises the channels through which health shocks affecting individuals (HB owners or other household members) can impact HB activity.

Figure 1. Impact of health shocks on household businesses: expected channels.



Two main questions are addressed. First, what is the overall effect of health shocks on HB (if the business operator is him/herself sick, or if another HH member is)? Second, between the two possible channels (time and money), which is the more important? Considering that the households are budget-constrained, and that the household and the HB budgets are often mingled, the primary expected channel is that large OOP expenditure might crowd out expenditure in the household business. Both are investigated separately, considering a possible crowding out of business expenditure and a negative effect on investment on the one hand, and a

decrease in labour input on the other hand. The empirical strategy relies on an original panel dataset of HBs, constructed from a large and nationally representative Vietnamese Household surveys. I am able to relate the Household Business to a large set of individual and household-level characteristics. Acknowledging the endogenous nature of health problems, I combine flexible control groups with fixed-effects regressions, and control as much as possible by time-varying factors to obtain plausibly causal estimations.

I find that the occurrence of serious sickness has a strong negative impact on the income generated by the HB (most of which is allocated to the household's budget). The decrease in working time resulting from serious health shock has little effect on HB, which may result from labour substitution mechanisms within the household. However, catastrophic health expenditures do translate into liquidity constraints: they cause a strong decrease in business-related expenditures. More importantly perhaps, they have a significant negative impact on investment. To the extent health shocks could lead to impoverishment and permanent income loss by threatening the HH's capacity to generate income, I argue that the social cost of sickness is thus larger than what has been measured in previous studies.

The remainder of the study is organised as follows. In the next section, I review the literature on the effects of health shocks on households' economic activities. Section 3 describes the surveys and the methodology used to build a Household Business panel, as well as the outcome and health shock variables. The identification strategy is explained in section 4, and the results are provided in section 5.

2. Literature review: health and household's economic activities

Much has been written on how the cost of health and the resulting coping strategies can cause impoverishment. As households borrow money, sell assets and reduce consumption, they might enter a vicious circle and fall into poverty. In Vietnam, as much as 60% of poor households in the rural north carry debt, and about 33% of them refer to health care costs as the major reason (Whitehead *et al.*, 2001; Nguyen *et al.*, 2002; Sepehri *et al.*, 2003; Nguyen *et al.*, 2012a). When selling asset rather than (or in addition to) borrowing, households can be deprived from a source of income (Eswaran & Kotwal, 1989; Tibaijuka, 1997; Van Damme *et al.*, 2004; Russell & Gilson, 2006). It is noticeably the case for land or cattle in the case of farmers. When consumption is affected despite the mobilization of additional cash, vulnerable households' food consumption might fall below the required level of calories intake, which could in turn reduce their ability to work. All groups are not equal. In Vietnam, urban (Wagstaff, 2007) and female-headed households are the least able to smooth their consumption after a health shock (Mitra *et al.*, 2016).

In the literature on impoverishment, the theoretical oversight of current consumption largely frames the evaluations of the effects of illness in developing countries. Yet, the relevant concept of household resource constraint is the permanent income (Okunade, Suraratdecha & Benson, 2010, pp. 366). As non-farm household businesses are the main income source of many households, the effects of health shocks could have through this channel, the largest consequences in the long run.

A first strand of literature deals with the effects of illness (or health shocks) for wage workers. Even in developed countries where social safety nets exist, ill health determines selection into the labour force, number of hours worked, and to a lesser extent, wages (Chirikos & Nestel, 1981, 1985; Cai, Mavromaras & Oguzoglu, 2014). In developing countries, where safety nets are weak or inexistent, health shocks limiting the ability to work impact productivity, and in turn labour income (Schultz & Tansel, 1997; Strauss & Thomas, 1998; Dercon & Krishnan, 2000; Kochar, 2004; Thomas *et al.*, 2006). It has also been shown that health shocks change the working behaviours of other household members when intra-household labour substitution exists: they may increase their labour contribution to domestic work, or seek additional income through other forms of employment. Indeed, activities are interweaved as several household members work together in farm or business activities (Benjamin, 1992; Dercon & Krishnan, 2000; Adhvaryu *et al.*, 2013); the labour supply of healthy members can thus be affected by sickness as

well. The deterioration of earnings is consequently found to be smaller at the household level as compared to the individual level (Genoni, 2012).

A second strand looked at the impact on agricultural activities (Yamano & Jayne, 2004; Beegle, 2005), which represent a source of livelihood for an often-dominant share of households over the developing world. For farmers, the effect of illness is more severe when it occurs during the peak agricultural season, and when the affected member is a working male (Kochar, 1995; Berhman *et al.*, 1997), even though compensation through increased paid work is feasible during the other periods. Conversely, an improvement in health condition may have direct positive effects on agricultural productivity, on the cultivation of other crops and on the extension of activities (Audibert & Etard, 2003).

When it comes to the effects on non-agricultural businesses, there is a surprising shortage of literature on the effects of health shocks or illness. In the context of a developed country (South Korea), Kim & Yang (2011) compared the business earnings of sick and healthy HH with cross-sectional data, and found the former to be significantly lower. Using Indonesian data, Sparrow *et al.* (2014) showed that income from self-employment is negatively affected by ill health. However, the result is only true for the non-poor and the formal sector; they thus likely capture skilled self-employed labour rather than the whole non-farm household business sector. Long-term effects, although mentioned, are not considered, and there is no distinction between lasting conditions and health shocks. Finally, Adhvaryu & Nyshadhamz (2014) point out the fact that household enterprises can serve as coping mechanisms in case of sickness under the form of small and ephemeral businesses. Prolonged illness or slow recovery from a health shock both cause household members to start non-farm business activities, and the cost of treatment seems to reduce the value of business assets.

Against this backdrop, this study focuses on existing HBs and assesses the impact of health shock on HB income and investment. Both of the above-mentioned channels (money and time) are investigated.

3. Data and descriptive statistics: building a HB panel and measuring health shocks.

This study uses the Vietnamese Household Living Standard Survey (VHLSS), a large-scale survey conducted every other year. It has a rotating panel component, whereby 50% of the sample from year n is kept in the following round, in year $n+2$. Each wave's renewed sample is drawn from the updated census listings using a three-stage stratified design, and representative at the national level. 45,000 households are included in the full sample each round, from which a sub-sample of 9,189 households answers the full questionnaire. This questionnaire includes on the one hand detailed information on health. It records with a 12 months reference period all health problems, outpatient and inpatient visits at the individual level, as well as detailed health expenditures. On the other hand, it includes a specific module on non-farm business, which records businesses' characteristics, income and expenditures. This module allows identifying who among the household members manages the business.

The core of this study relies on a dataset constructed from the VHLSS by taking these non-farm HBs as observation units. From the 2006 and 2008 surveys, a unique HB identifier was built using individual identifiers and activity numbers, which allowed matching units between years.²⁹ Household and individual characteristics, especially information on health, were then matched through information on the individual in charge of the HB. The resulting dataset includes 8,090 HBs (4,161 in 2006, and 3,929 HB in 2008). This approach allows accounting for multiple HBs by households: in the initial year, the 4,161 HBs belong to 3,980 individuals from 3,185 unique households. Most of the observations (80.74%) are primary activities and only the remaining 19.26% are secondary HB. In other words, 81 per cent of the household businesses in the sample are the main source of income for their owners.

The core of the analysis focuses on the balanced panel. The notion of HB panel is not trivial. First, not all households from the panel are resurveyed in the next round: the attrition rate for households is close to 10 per cent. Second, the household composition may change between rounds (the VHLSS does not follow, for instance, individuals who move from their original location). Third, even when individuals can be matched, they may no longer operate a HB. There is thus household, individual as well as HB attrition. Matching HB by considering individual identifier and activity number thus amounts to considering that HBs that are operated by the same individual are a single observation. This implies that these HBs may have changed between

²⁹ A similar approach is used in Nguyen & Nordman (2014) with the 2004-2006 surveys, and yields a sample of HB of comparable size.

rounds: they may operate in a different place, and sometimes switch industry. It also implies that if some other individual took over the HB, it is treated as a new production unit (and thus not kept in the balanced sample).

Many other studies rely on the VHLSS panel, and have discussed the randomness of attrition at the individual and household level (see, e.g., Baulch, 2011). But the attrition of household businesses may differ. The balanced panel includes 1,908 HB (954 per year). Recalling that only 50% of households are kept in the sample between rounds (the renewal rate is applied to the whole sample, not only to households operating a HB) and that 50% of the 2008 HBs belongs to newly surveyed households, the HB attrition is actually low. It is however of prior interest to analyse its randomness. If it can be linked with health shocks, HB survival can be considered as the first outcome (see section 5).

i. Outcomes

The objective of this study is to take household businesses as observation units to investigate how vulnerable they are to health shocks. The final outcomes, besides HB survival, are accordingly HB income and investment. The intermediate outcomes are the expenditures in the HB. These variables are defined as follows. To measure HB income, I use the natural logarithm of the total income generated during the last 12 months by the household business. It corresponds to the total revenue (sales) to which is added the value of exchanged goods and services, self-consumption, and the value of by-products. Including all destinations of production rather than the purely commercial income gives a better measure of the overall business activity. Net profits are used as robustness check. The set of intermediate variables provides more details on the mechanisms through which the businesses are affected. I use the logarithm of the total expenditures in the HB, and of two sub-components: expenditures on raw materials, and total intermediate consumption. These variables are built from a list of expenditures recalled over the past 12 months, including self-supplied, purchased, bartered, and recuperated items.

Intuitively, illness could be associated to a more risky environment, and thus discourage investment. When considering the resulting financial burden rather than illness itself, it might be that OOP payments for health crowd out investment; health shocks could then threaten the businesses' capacity to grow. The second outcome is accordingly the probability to invest in the past period. Investment is proxied by the purchase of fixed assets by the household in the past period. The variable used is a binary indication of non-zero spending on fixed assets at the household level.

ii. Health shocks, time costs, and monetary costs indicators

The literature relies on different indicators to capture health problems. Numerous studies focusing on the occurrence of a specific disease rely on self-reported *health status*, measurement error of which is a known problem (Schultz & Tansel, 1997). Others use changes in physiological indexes (Wagstaff, 2007; Gertler & Gruber, 2002) such as the Body Mass Index, or measures of Ability to perform activities of Daily Living (ADLs). Arguably capturing better severe health events when compared with other self-reported health measures, these variables nevertheless overweight the disabilities associated with ageing. Another strand of literature focuses on health shocks. Two conditions are required to narrow the general notion of health problem down to the one of health shock. First, the event must be a severe illness or injury, that is, an ill event with a potential to have a significant influence on the individual and/or the household's living conditions. Second, it should be as much as possible a *shock*, that is, an unexpected (and thus exogenous) event. Ill events of little consequences, or anticipated (as manifestations of chronic diseases or poor health) are consequently not strictly speaking health shocks. Commonly used variables to measure health shocks and their severity include the number of missed days at work, inpatient spells (used per se or with various thresholds), or days in bed (Mitra *et al.*, 2016). Although narrowing to potentially influential health problems, these variables do not guarantee the unexpected nature of the shock. Furthermore, they suffer from the unobserved influence of heterogeneous individual choices. Missing days at work does not represent the same cost for everyone (as mentioned in the introduction, and in Strauss & Thomas, 1998; Genoni, 2012).

The “health shock” variable used in this study is constructed accordingly as a binary indicator of (1) the individual reporting “illness or injury” in the reference period and (2) this illness resulting in the individual being “absent from work or unable to carry regular activity” for more than one day. I further restrict the analysis to individuals who were not sick or injured in the initial period (see section 4) to ensure that these health problems are “new”. It might be of concern that the long recall period could result in measurement error. However, we assume that only the sufficiently rare and memorable ill events will be reported given the length of the recall period, and those are the ones of interest. Another source of bias lies in potential differences in reporting illness given the declarative nature of the variable. Income may increase, for instance, the propensity to seek treatment (and thus the reporting) for what would be otherwise considered minor diseases. Finally, as mentioned above, the opportunity cost of resting varies with the type of activity and the income level. These two potential biases would lead to underestimate the effect of illness on the poorest. Indeed, if the lowest income quintiles underreport illnesses or

injuries, and tend to stop working less often while ill or injured, their diminished outcomes will be wrongly categorized as “unaffected” observations and all estimations will yield conservative estimates.

The relevant unit of observation in case of health shock is the whole household. Even if sickness of the HB operator is expected to have the highest influence, solidarity within the household implies sharing the monetary costs as well as devoting time to sick members. Thus, an indication of other household members being seriously sick (notwithstanding the status of the HB operator) is constructed following a similar method.

The other aim of this study is to investigate separately the two channels of influence: monetary and time costs. Both variables are defined as follows. For the time cost indicator, I use the number of *days absent from work*, which can be computed at the individual, and the household level. I use for monetary costs the total out-of-pocket health expenditures at the household level. As mentioned in section 2, a narrow understanding of the cost of treatment would lead to underestimate the cost of health shocks. The expenditure level variable hence sums all OOP expenditures related to outpatient and inpatient visits, prescribed and non-prescribed medicines, travel and parking costs, medical tools, health insurance, and bonus for doctors. In line with the literature, I use a threshold to define “catastrophic” health expenditures, set to 10 per cent (Wyszewianski, 1986; Wagstaff & Van Doorslaer, 2003; Russell, 2004). This share is usually defined in percentage of the total household income, or as a share of its total –or non-essential– consumption. The observation unit of this paper being production units rather than households, I relate the OOP health expenditures to the income of the HB rather than to the total income of the household. The aim is to relate the health expenditure at the household level to the size of the business. The choice of threshold is somehow arbitrary (McIntyre *et al.*, 2006), and lower expenditure levels may also be catastrophic for poor households.³⁰ Convincing evidence on the issue thus cannot make the economy of using a flexible threshold, which is done (together with a continuous measure) as robustness check. Using OOP health expenditures to define the monetary aspect of health *shocks* has two noticeable limits. First, it will mechanically exclude sick individuals who choose not to utilize health care –or cannot afford to do so; in which case the impact of health shock will be underestimated. Second, when rich households are included,³¹

³⁰ the ratio of OOP payments’ share in income for the poorest over the richest families ranges from one to ten (Pannarunothai & Mills, 1997).

³¹ It is not the case in this study where the population of interest is restricted to small-scale household business owners.

large payments can be classified as health-related while they fall within aesthetic or comfort expenditures (Kim & Yang, 2011).

Health shocks thereby defined are closer to the notion of unexpected and serious events than when considering all illnesses and injuries. They are nonetheless still linked with the income level of the household business: poorer individuals, operating more precarious HBs, experience more frequent health shocks (see below). Their incidence also depends from individual behaviours that can impact business performance, such as risk-taking or education attainment. Grimm & Treibich (2016) showed for instance that risk-adverse individuals are more likely to wear a helmet when driving, which might result in less frequent (road) injuries. Higher education levels can also lead to both performing businesses, and to less risky behaviours; as showed by de Walque (2010). Health shocks, despite being restrictively defined, are accordingly treated as occurring endogenously in this study (see section 4).

iii. Sample description: incidence of health shocks and HB characteristics

Matching household businesses between the 2006 and 2008 surveys yields a sample of very small production units. The average number of workers, including the owner, is 1.65 workers. This figure is consistent with representative data on the Vietnamese informal sector (Cling *et al.*, 2010). Two thirds of the HBs are made of a single own-account worker, while the remaining units employ on average less than two workers in addition to the head of the business. 76% of these HBs are informal, in the sense that they have no Business Registration Certificate.

Among the 954 HBs of the balanced panel, 281 experienced a health shock in 2006 and 297 in 2008. 673 had no health shock before the initial survey in 2006, among which 156 experienced a health shock between the two years, which is the sub-sample used in the first part of the analysis. Affected individuals missed on average 12 days of work because of these illnesses or injuries. At the same time, the households to which these HBs belong had on average 1.4 sick members in addition to the HB owner (with a maximum of 11 individuals simultaneously sick), who missed 16 to 20 days of work (or “normal activity” for the inactive). Health expenditures of households with a sick member amount to nearly 2 million dong (around 100 USD), which represent 24% of the total income generated by the HB.

Table 1 provides descriptive statistics by year and additional comparisons between household businesses whose operators experienced – or not - health shocks during the past 12 months. We compare means in the outcome variables and health indicators, as well as the household and HB characteristics later used as control variables. It should be stressed that the sample is split for this description according to the health status of the HB operators only: it is thus possible that other HH members are affected by illness while the operator of the considered HB is not. First, HBs whose head is sick are generating significantly less income. Whilst this relationship is all but causal at this point, since poorer households might experience more frequent health shocks, it is still an indication of a common evolution. They overall report inferior expenditures dedicated to the HB, which is confirmed by t-tests for the total expenditures in 2006. The probability to invest, as well as the amount invested, is also inferior among sick individuals. Second, illness of members within the same household is apparently not independent: the number of other sick members as well as the total number of days unable to work is significantly higher in the households where the businesses' operators are sick or injured. Third, health shock affecting HB's head is a discriminating factor when comparing household expenditures for health and the incidence of catastrophic spending, defined with respect to the HB income. Finally, HBs whose operator is ill are more often informal businesses, vulnerability of which is higher in other aspects.

Table 1. Sample description: incidence of health shocks, HB characteristics and geographic repartition

	2006		2008			2006		2008	
	HB head w/ health shock	No HS	HB head w/ health shock	No HS		HB head w/ health shock	No HS	HB head w/ health shock	No HS
Nr. of HB	281	673	297	657	Business size	1.58	1,65	1.651	1.672
Outcomes					P(size>1)	0.33	0,358	0.353	0.354
HB income	26,892**	34,905	52,764	59,352	Ethnic minority	0.06	0,038	0.048	0.048
P(invested)	0.12	0.15	0.14	0.11	Urban	0.33	0,378	0.325**	0.392
Amount invested	1,741	2,937	2,843	2,839	Informal (no BRC)	0.82*	0,757	0.772	0.732
Expenditures dedicated to the HB					Premise				
Total exp. in HB	14,025*	19,139	32,084	34,707	Non-permanent premise	0.14	0.125	0.145	0.100
Materials	7,887	10,867	22,679	21,941	At home	0.54	0.577	0.568	0.582
Intermediate Cons.	3,438	4,482	4,793	7,125	Permanent place	0.32	0.298	0.287	0.319
Health shocks					Household size	4.12***	4.408	3.965***	4.380
Illness	1***	0.38	1	0.402	Region				
#days of work missed	12.32***	0	11.721***	0	Red river delta	0.27	0.227	0.260	0.232
health shock	1***	0	1***	0	North East	0.09	0.089	0.121**	0.074
# other HH members ill	1.359***	1.019	1.401***	1.093	North West	0.03*	0.012	0.031**	0.011
#days of work missed in the HH	20.103***	1.712	16.424***	3.673	North Central	0.11	0.113	0.111	0.112
health shock in the HH	0.585***	0.089	0.598***	.085	South Central	0.12	0.115	0.076***	0.135
Catastrophic OOP expenditures	0.363***	0.208	0.337***	0.215	Central Highlands	0.05	0.045	0.073**	0.035
Total HH health expenditure	1,628*	1,111	2,437*	1,880	South East	0.10	0.166	0.125	0.160
Proportion: HH health exp. /HB income	0.236***	0.084	0.247***	0.122	Mekong Delta	0.23	0.233	0.204	0.240

All monetary variables (HB income, amount invested, expenditures, HH health expenditures) expressed in 1,000 VND.

Significance levels are indicated for t-tests between years. *** p<0.01, ** p<0.05, * p<0.

4. Identification

The following section describes the identification strategy adopted to obtain plausibly causal estimates of the influence of health shocks on HBs. The panel dataset consists in two rounds of observations of a sample of household businesses, of which some operators reported health shocks (and/or health shocks within the household).

Beyond a preliminary estimation of the effect of health shocks on the probability to keep operating a household business, the objective of the analysis is to evaluate the overall effect of experiencing serious (and new) illness or injury on the HB income. While informative, this global picture somehow combines the two possible channels of influence: monetary and time costs. The second objective is thus to investigate them separately. The effects of out-of-pocket health expenditures (at the household level) on HB activity are determined first. In order to grasp the mechanisms at stake, the effect of these costs are then estimated on the set of variables related to expenditures in the business to show the magnitude of the substitution at play. Potential long-term influence of health shocks may occur through reduced investment in the business, which is taken as the third outcome. Finally, the effects of time costs are isolated on all outcomes.

Health shocks are not exogenous: even when restricting the variable of illness and injuries to new and serious events, it is necessary to overcome several identification challenges. First, in line with the definition of health shocks as newly occurring events, and to ensure that relevant comparison group are used for each question of interest, I use flexible control groups. I investigate the three questions on sub-samples of HBs that did not experience those events in the first period. Second, endogeneity remains a concern: omitted factors (such as risk aversion) might drive both the occurrence of a health problem and the HB's level of operations. Household businesses fixed effects are used in all specification to remove unvarying unobserved factors to the individual, the household or the business level that might drive the results. In order to control for time-varying factors, I also control for a large set of time-varying variables arguably unaffected by health and having an influence on the outcomes. I further introduce differentiated time trends by region, and test various interactions for heterogeneous effects. Third, reverse causality could be a problem as a reduced activity level of the HB may perhaps influence the health status of its operator, especially among the poor and the households with limited sources of income. The anteriority of events for the time periods considered however rules out such possibility.

i. Flexible control groups

The questions of interest are: (1) the overall effect of health shocks on HB income; (2) the specific effect of the monetary costs at the household level (measured by catastrophic OOP health expenditures) on HB income, HB spending, and HB investment; and (3) the specific effect of labour supply decrease (measured by the number of working days lost because of health problems).

The objective of evaluating separately each of these questions and to focus on newly occurring events involves restricting the sample to a relevant control group for each question. First, the effect of health shock experienced by the HB owners (interacted with those affecting other household members) is evaluated on the HB population whose owners were healthy in the initial period (2006). Second, the effect of catastrophic OOP health expenditures is evaluated on the sub-sample of households that did not have to cope with such spending in the initial period. The sample is further restricted to the HBs not knowing catastrophic OOP expenditures, **and** whose owner does not miss working days because of sickness, in order to obtain the specific impact of catastrophic spending and take out the influence of reduced labour inputs. Similarly, HBs that experienced a labour supply decrease following a health shock are compared only to HBs not experiencing catastrophic OOP and whose head operator initially worked full-time. The health shocks are thereby restricted as much as possible to the unexpected, and arguably exogenous, events, and the time costs effects are isolated. The observations from the “treatment” and “control” groups that correspond to this approach are summarised in the following table.

Table 2. Control groups and observations.

Question	Indicator	Control group		# (id)	Treatment group		# (id)	Total obs.
		2006	2008		2006	2008		
Overall effect of HS								
	(New) serious sickness	0	0	510	0	1	151	1322
Monetary costs								
	Catastrophic OOP expenditures	0	0	567	0	1	136	1406
	€ (Restriction) HB owner sickness	0	0	342	0	0	71	826
Time costs								
	Days absent from work (ref: 0)	0	0	527	0	1+	157	1368
	€ (Restriction) catastrophic OOP exp.	0	0	411	0	0	143	1108

ii. Unobserved heterogeneity

The possibility remains that unobserved factors drive the probability of health shock, and affect at the same time HB operations. Old age, poor shape, or other physiological factors associated with a low income may affect the probability to be ill, and at the same time correlate with a variety of HB-related variables. A pre-existent chronic illness could for instance have no declared influence in the first period and turn out to have consequences on both health and business in the second. It is also the case for individual attitudes toward risk, which might drive business performance as well as the incidence of injuries. It is worth mentioning that in both cases, the unobserved factors would lead to underestimate the effects of health shocks.

In order to obtain plausibly causal estimates, all specifications use household businesses fixed effects to remove unvarying heterogeneity. By using the difference across time for the same HB, all regressions eliminate the influence of observed and unobserved time invariant factors. Observations being matched at the individual-household level, all factors at the individual, HH or HB level will be differentiated out. Individual characteristics, family background, individuals' health endowment, as well as fixed HB characteristics (such as owner's ability, etc.) will thus be controlled for. Standard errors are further clustered at the household level, where shocks and responses are expected to be comparable. Overall, it is the effect of health shocks on the evolution of the household business activity that is evaluated by estimating the following models:

$$Y_{it} = \beta_0 + \beta_1 HS_{it} + \beta_2 X_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

Where Y_{it} is the outcomes of HB i at time t , HS_{it} the health shock indicator (new serious sickness for the overall impact, and subsequently monetary and time costs indicators), and μ_i is the HB fixed effect. These specifications do not handle biases associated with time-varying factors. All of these observed factors are included in the vector X_{it} . Time-varying observables include household size to account for changing economies of scale (Okunade, Suraratdecha & Benson, 2010); HB operating conditions (type of premise), and informality status. As health insurance is expected to have an influence on both types of costs of illness, we include indications of health insurance status of the head, as well as the number of other household members having health insurance. An additional concern is that the potential divergent economic situations by geographic area might explain a different evolution of income and yield biased estimates. If, for instance, some remote rural areas were lagging behind in terms of economic growth, an undifferentiated estimation of the prevalence of health shocks might overstate their influence on

those units. All models include a time trend, which is allowed to vary by region; common changes at the regional level that may be correlated with illness, such as changes in infrastructures, are thereby included.

iii. Reverse causality

At the aggregate level, higher income often translates into a better health in developing countries (Strauss & Thomas, 1998). At the individual level, the work status is known to influence the likelihood of experiencing health shocks: health can deteriorate with employment –or lack thereof- and labour market history (Kerkhofs & Lindeboom, 1997). Yet, the association between changes in income and changes in (self-rated) health in the short run is small and “probably reduced to the null” (Gunasekara, 2011).

It is still possible, although unlikely, that when considering a population of HBs a decrease in income might render individuals who rely on the business more vulnerable to health problem, noticeably for those HH where the HB is the main source of income. This reverse causality is yet likely to occur, if any, in the medium to long run only: it would take at least several months for individuals’ health to suffer from a decreased HB activity through reduced calories intake. The difference of HB activity between the two periods could not plausibly affect individual health (and *a fortiori* not the incidence of health shocks) in the past 12 months. A final check that HB income had no effect on health shocks incidence was nevertheless conducted and no significant influence was found. Finally, it is still possible that health shocks occurred in 2007, in which case they will be reported only if they still had an influence on health during the past 12 months.

Inference with observational panel data is rarely exempt from limitations, and the shortcomings of this identification strategy should be acknowledged. Even when carefully defining health shocks, removing unvarying heterogeneity, controlling for time-varying observed heterogeneity and differentiated trends, the possibility remains that time-varying unobservable factors introduce some bias in the results.

5. Estimation results

The core of the analysis focuses on the balanced panel. A key preliminary question is however to determine to what extent health shocks influence business survival. Restricting the sample to households surveyed both years, which eliminates household and individual attrition, it is possible to define HB attrition as defined as HBs that stopped operating while the household has been resurveyed. In other words, I consider the households that initially had a non-farm business and stopped operating it in the second period. Regressing with OLS the probability to keep operating a household business (among balanced households) on the indicators of health shocks, I find that catastrophic health expenditures at the household level do have a significant influence at the 5% threshold. Households that did not have to meet such catastrophic expenditures are on average 5.9% more likely to keep operating their business. Integrating this preliminary impact of health shocks on business survival in the following results could be achieved by reweighting observations using the survival probability (*via* Heckman correction models). The choice made in the remainder of the analysis is however to estimate all effects without correcting for business survival. Indeed, as this effect is only estimated on those households that were re-surveyed in 2008, it is not possible to integrate the “full” effect of health shock on attrition (i.e. on households or individuals completely disappearing from the sample), and the corrected estimates would thus introduce a further bias. All of the following results are thus conservative estimates in this regard, as integrating business survival would lead to increase the impact of health shocks.

i. On the overall exposure of HB to health shocks

The first question concerns the overall effect of health shocks on the HB activity. Table 3 provides the results of the fixed-effects panel estimates, which regress the log of total HB income on the dummy indicating health shock experienced by the business operator, interacted with a similar dummy for other members within the same household. The four models correspond to the estimation of the following equation:

$$Y_{it} = \beta_0 + \beta_1 HS_{it} + \beta_2 HS_{it}^{other\ ind.} + \beta_3 (HS_{it} * HS_{it}^{other\ ind.}) + \beta_4 X_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

where Y_{it} is the log of household business income, HS_{it} the health shock indicator for the HB owner (new and serious illness or injury). In order to account for the additional influence of simultaneous illness of other household members, it is interacted with $HS_{it}^{other\ ind.}$, the indicator of health shock for other household members. All models include HB fixed effects, time trends

and regional interactions. Columns 1 and 2 differ by the exclusion or inclusion (for col. 2) of time-varying controls. Columns 3 and 4 estimate the same model, but additionally include interactions of the time variable with Ethnicity and Urban indicators, accounting for potentially different trends in these regards. These are an additional guarantee that the possible correlation between unobserved time-varying characteristics inherent to the variables included and the error term is controlled for. The sub-sample of interest is the group of household businesses whose operator was not sick in the initial period (2006), among which 157 were affected by a health shock before the second period.

Table 3. Effects of health shocks (defined as severe illness) on Household Business income

	Whole sample		Whole sample Including trend tests	
	(1)	(2)	(3)	(4)
Health shock, HB head	-0.243*	-0.244*	-0.248*	-0.252*
	(0.146)	(0.147)	(0.145)	(0.147)
Health shock, other HH members	0.110	0.083	0.113	0.085
	(0.099)	(0.096)	(0.101)	(0.097)
HS(head)*HS(HH)	0.066	0.101	0.067	0.106
	(0.197)	(0.197)	(0.198)	(0.198)
Time	0.376	0.394	0.454	0.454
	(0.458)	(0.430)	(0.416)	(0.401)
Premise (home)		0.112		0.112
		(0.133)		(0.133)
Premise (permanent)		0.099		0.100
		(0.104)		(0.104)
HH size		0.095*		0.091*
		(0.053)		(0.053)
Informal (Bus. License)		-0.169**		-0.169**
		(0.081)		(0.080)
Health Insurance of HB head		0.100		0.096
		(0.089)		(0.090)
# other HH members having HI		0.005		0.006
		(0.007)		(0.007)
Time*Ethnicity			-0.217	-0.161
			(0.192)	(0.189)
Time*Urban			0.017	0.003
			(0.074)	(0.074)
Constant	9.775***	9.336***	9.775***	9.345***
	(0.021)	(0.226)	(0.021)	(0.227)
Observations	1,368	1,368	1,368	1,368
R-squared	0.168	0.187	0.170	0.188
Number of id(hb)	684	684	684	684
Regions*time	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

All models use the log of total income generated by the Household Business as outcome variable. All include HB fixed effects. Col. 1 includes health shocks only, while col.2 includes time-varying cofounders. Col. 3 and 4 include the time-trend interactions.

Sickness of the HB operator does reduce significantly the income generated by the business. The HB whose operator was seriously sick underperformed by nearly 28%,³² compared with those whose operator was not sick (knowing that all were initially healthy). Sickness among other HH members has no specific effect, and neither does the simultaneous occurrence of both. Differences in ethnicity and location do not seem to be associated with significantly different evolutions. Among the time-varying controls, it appears that an increased household size does have a mitigating effect (perhaps through increased economies of scale), and that informality is negatively associated with business income. Finally, it is worth stressing that the inclusion of time-varying controls has a very limited impact on coefficients, which could vouch for the remaining unobservable bias to be low.

These overall effects account for both the “income shock” effect, and the effect of a reduced labour supply, which are disentangled below.

³² As the outcome variable is log transformed.

ii. Catastrophic health expenditures

Health shocks have, on average, a large negative impact on HB income. Two underlying mechanisms can be at stake. First and foremost, large OOP health expenditures can severely constraint the household's –and in turn the businesses'– liquidity. The results regarding the impact of catastrophic OOP health expenditures on HBs are presented below. All results use a 10% threshold in the core of the study to define catastrophic health expenditures, in proportion of the HB income; other specifications are used as robustness tests.

a. How household health expenditures crowd out business expenditures

Table 4 provides the estimation results related to the effects of catastrophic health expenditures within the household on the household business. Specifically, the sample is restricted to households that did not have to face catastrophic payments in the initial period, and the income of businesses whose HH was affected by a health shock resulting in a catastrophic payment is compared with the still unaffected ones. The regressions estimate the following model:

$$Y_{it} = \beta_0 + \beta_1 OOP_{it} + \beta_2 X_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

where Y_{it} is in the first two columns the HB income, and OOP_{it} an indicator of the household to which the HB belongs having to face (new) catastrophic Out-of-Pocket health expenditure (defined initially as weighing more than 10 per cent of the business income). Fixed-effects regressions show a significant and large effect. The affected businesses' income is inferior by nearly half in the first specification. Column 2 further restricts the comparison group to the businesses (1) not affected by catastrophic OOP payments and (2) whose operator was not sick. This enables us to capture the specific effect of large monetary expenditures for serious sickness of other household members when the HB owner did not miss working days. The effect is still significant and large: the monetary consequences of health shocks decrease total HB income by more than a third. The effect on the first group is larger as it also includes some HB owners affected themselves by a health shock.

In order to confirm the liquidity constraint hypothesis, I regress the intermediary indicators (variables indicating expenditures in the HB) on catastrophic OOP expenditures. The model is similar to equation (3), except that Y_{it} stands for the level of expenditures in the household business. The results show that having to face large health payments indeed affects the money that constrained households can afford to dedicate to the business: expenditures on materials and

total intermediate consumption all significantly decrease, and total expenditures in the HB are reduced by two thirds. Columns 3, 4 and 5 use the log of expenditures in the HB as outcome variables: total expenditures in the business (col. 3), expenditures on materials (col.4, which only concerns part of the HB), and total intermediate consumption (col.5). This finding is coherent with the one of Fafchamps *et al.* (2014) who suggest a “*flypaper effect*” among microenterprises whereby cash does not stick in the business, but rather serves other purposes for the whole household. In the present case, cash is used in priority to meet high health expenditures, and there is a clear crowding-out effect.

Table 4. Effects of catastrophic health expenditures on HB income (col 1-2), and on expenditures in the business (col. 3-5).

Outcome:	(1) HB income	(2) HB income	(3) Total expenditures in the HB	(4) Expenditures: materials	(5) Total intermediate consumption
Catastrophic health exp. (HH)	-0.460*** (0.090)	-0.350*** (0.119)	-0.571*** (0.151)	-0.824*** (0.240)	-0.336*** (0.122)
Time	0.455*** (0.159)	0.544** (0.220)	0.343 (0.212)	-0.372 (0.739)	0.283 (0.269)
Premise (home)	0.129 (0.121)	0.118 (0.148)	0.133 (0.220)	0.619 (0.393)	-0.052 (0.169)
Premise (permanent)	0.220* (0.112)	0.130 (0.132)	0.281 (0.198)	0.933** (0.474)	0.099 (0.170)
HH size	0.093** (0.045)	0.139* (0.079)	0.066 (0.062)	-0.090 (0.103)	0.072 (0.054)
Informality	-0.101 (0.084)	-0.109 (0.104)	-0.097 (0.130)	0.414** (0.194)	-0.134 (0.114)
Health Insurance of HB head	0.064 (0.079)	0.067 (0.099)	0.063 (0.127)	-0.207 (0.162)	-0.070 (0.125)
# other HH members having HI	-0.002 (0.006)	0.003 (0.009)	-0.001 (0.010)	0.012 (0.019)	0.005 (0.010)
Constant	9.501*** (0.207)	9.346*** (0.339)	8.348*** (0.314)	8.209*** (0.600)	7.264*** (0.275)
Observations	1,446	850	1,446	705	1,435
R-squared	0.164	0.193	0.070	0.109	0.046
Number of id(hb)	723	425	723	423	722
Regions*time	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

Columns 1 and 2 regress the log of total HB income on the indicator of catastrophic OOP expenditures. The control group in col. 1 is the population of HBs, whose household did not have to meet catastrophic OOP expenditures. It is further restricted in column 2 to HB owners who were not sick (and thus lost no time because of illness). Columns 3 to 5 regress the log of expenditures in the HB on catastrophic OOP expenditures.

b. Catastrophic health expenditures and investment

The current operations of HBs are therefore strongly affected by health shocks, in particular by the large and unexpected expenditures. This effect implies an income loss by itself. Another angle of interest is the growth potential of businesses, which can be affected if health shock have an impact on investment. Table 5 provides the results of linear probability models, since they estimate equation (1) with a binary outcome. They regress the binary variable Y_{it} indicating expenditures for fixed assets by the household on the indicator of catastrophic health expenditures. This variable is an alternative to the often-used replacement cost of invested capital –which might be difficult to evaluate and could include parasite spending. In line with previous regressions, all models use HB fixed effects. Similarly, the control group in the first two models is the set of households not experiencing catastrophic spending. It is further restricted to the non-sick operators in columns 3 and 4. For each group, time-varying controls are progressively included.

Table 5. Effect of catastrophic health expenditures on investment.

	(1)	(2)	(3)	(4)
Catastrophic OOP health expenditures	-0.164*** (0.048)	-0.163*** (0.048)	-0.129* (0.067)	-0.122* (0.068)
Time	0.123 (0.086)	0.140* (0.083)	-0.186 (0.201)	-0.027 (0.096)
Premise (home)		-0.017 (0.064)		-0.038 (0.098)
Premise (permanent)		0.045 (0.059)		0.027 (0.089)
HH size		0.036* (0.021)		0.021 (0.029)
Informality		-0.036 (0.046)		-0.019 (0.058)
Health Insurance of HB head		-0.026 (0.041)		-0.045 (0.046)
# other HH members having HI		0.002 (0.004)		-0.002 (0.005)
Constant	0.140*** (0.010)	0.004 (0.105)	0.153*** (0.012)	0.112 (0.145)
Observations	1,446	1,446	850	850
R-squared	0.028	0.038	0.022	0.028
Number of HB	723	723	425	425
Regions*time	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

The dependent variable is the acquisition of fixed assets. As above, columns 1 and 2 restrict the control group to the population of HBs whose HH did not have to meet catastrophic health payments. The control group in columns 3 and 4 is further restricted to the HB whose head was not sick. The difference between models 1-2 and 3-4 lies in the inclusion of time-varying controls.

Investment is significantly lower among affected households: it decreases by 16.4 per cent in the first two specifications, and from 12 to 13 per cent in the last two models. It is worth noting that borrowing increased at the same time (results not reported) to meet catastrophic health expenditures: all in all, a health shock deprives the household from the needed liquidities for investments, and reduces the HH's future borrowing capacity. Shortfalls in HB investment could severely endanger their growth potential, and the overall ability of the HB sector to benefit from economic growth.

iii. The labour supply channel, and intra-household labour substitution

Health shocks when measured by the decrease in labour supply have a much weaker influence on HB activity. Using comparable fixed effects specification and restricting the sample to HBs (1) initially not losing labour input to health shocks, and further (2) whose households are not coping with catastrophic OOP health expenditures, I find a very small -or insignificant- association with all outcomes.

Table 6 provides the results of regressing HB income on a continuous variable measuring the number of days absent from work of the HB owner, the total number of days that other household members spent in bed (excluding HB owners), and the interaction between both terms. The estimated models are:

$$Y_{it} = \beta_0 + \beta_1 Days_{it} + \beta_2 Days_{it}^{other\ ind.} + \beta_3 X_{it} + \mu_i + \varepsilon_{it} \quad (4)$$

All time-varying controls are included as in previous models, as well as regional trends. In line with the identification strategy, all regressions are restricted to health events not existent in 2006. This measures the effect by comparing with HB owners initially missing a small (less than 10) number of days (column 1), or no days at all (column 2). In order to separate the labour supply decrease from the monetary effect, a further restriction is made to households not experiencing catastrophic health expenditures (column 3).

If HB owners are expected to bear time costs upon taking care of other household members, the total number of days spent in bed within the household should have a direct negative influence on HB income. Symmetrically, if other household members are able to substitute for the HB owner when he/she cannot work, the direct labour supply decrease should have a lesser impact on HB activity. All models affirm the former, and confirm the latter hypothesis. Both days away from work and days in bed of HH members have a consistently small and/or insignificant impact on HB income. Similar regressions (not reported) failed to show any significant effect on investment or on expenditures in the HB.

Table 6. Effects of labour supply decrease on HB income

	Initially missed <10days	Initially missed no days	<10days & no catastrophic OOP exp.
# Days being absent from work	-0.010** (0.005)	-0.010** (0.004)	-0.005 (0.005)
# Days in bed of other HH members	-0.002* (0.001)	0.000 (0.002)	-0.001 (0.008)
Interaction days (head)*days (HH members)	0.001* (0.000)	0.000** (0.000)	0.001 (0.001)
Time	0.351 (0.413)	0.402 (0.271)	0.453** (0.177)
Premise (home)	0.120 (0.128)	0.096 (0.123)	0.109 (0.126)
Premise (permanent)	0.107 (0.099)	0.094 (0.096)	0.258** (0.112)
HH size	0.097* (0.053)	0.084** (0.041)	0.067 (0.057)
Informality	-0.206** (0.084)	-0.196** (0.076)	-0.119 (0.098)
Health Insurance of HB head	0.110 (0.087)	0.053 (0.073)	0.063 (0.081)
# other HH members having HI	0.005 (0.007)	0.001 (0.006)	-0.000 (0.007)
Constant	9.344*** (0.230)	9.404*** (0.182)	9.757*** (0.258)
Observations	1,368	1,780	1,108
R-squared	0.193	0.203	0.217
Number of HB	684	890	554
Regions*time	Yes	Yes	Yes

Robust standard errors in parentheses

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

All models explain the log of HB total income. Columns 1 restrict the control group to the population of HB owners who missed less than 10 days of work in the initial period. Column 2 does so on HB owners who missed no day at work in 2006. Column 3 further restricts to households not coping with catastrophic OOP health expenditures.

This result can be understood in several ways. First, a major difference with the monetary channel is that time costs may be retrievable. HB owners can make up for missed days upon returning to work, which is not possible when meeting large OOP health expenditures. Second, intra-household labour-substitution is likely to compensate for part of the decrease in labour input (Sauerborn *et al.*, 1996). There is no direct measure of working time of other household members in the HB, which makes a direct test of this effect impossible. It is yet worth noting that even when time costs have no direct impact, labour substitution can have adverse consequences by itself. Getting other HH members to work might have negative effect such as attending schools and looking after the children (Mutangadura, Mukurazita & Jackson, 1999).

6. Robustness

I provide several types of robustness checks. First, an alternative outcome variable is used to conduct again the whole analysis. As total HB income and decrease in HB expenditure could compensate one another, it is necessary to check the effects of health shocks (overall and through the two possible channels) on net profits of the HB. Table 7 provides the results of all preferred specifications regressing HB income on health shocks, catastrophic OOP health expenditures and time costs, using net profits of the HB. Columns 1 and 2 use health shocks indicators affecting HB owners and/or other family members (as in columns 1 and 2 in table 3). Columns 3 and 4 use indicators of catastrophic health expenditures as done in the first two columns of table 4. Finally, continuous measures of time costs (number of days absent from work) are used in models 5 and 6, and are interacted with total days in bed of other HH members. All results strongly resemble to the core analysis in direction, significance levels and magnitude.

Table 7. Effect of health shocks (severe illness) on HB net profits.

	(1)	(2)	(3)	(4)	(5)	(6)
	Health shocks	Health shocks	Catastrophic OOP exp.	Catastrophic OOP exp.	Labour supply	Labour supply
Health shock, HB head	-0.222* (0.134)	-0.223* (0.135)				
Health shock, other HH members	-0.018 (0.074)	-0.042 (0.074)				
HS(head)*HS(HH)	0.163 (0.172)	0.190 (0.171)				
Catastrophic OOP health exp.			-0.425*** (0.085)	-0.336*** (0.116)		
# Days absent from work					-0.008** (0.004)	-0.008* (0.005)
# Days, other HH members					-0.002** (0.001)	-0.006 (0.006)
Interaction: days					0.000 (0.000)	0.001 (0.001)
Time-varying controls	No	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Regions*time	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,368	1,368	1,446	850	1,368	1,108
R-squared	0.173	0.187	0.179	0.214	0.191	0.236
Number of id	684	684	723	425	684	554

Robust standard errors in parentheses

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

All models use the log of total profits as outcome variable. All include HB fixed effects. Col. 1 includes health shocks only, while col.2 includes time-varying cofounders Columns 3 and 4 use catastrophic health expenditures in the household. The control group in column 3 is the whole population of HBs whose HH did not have to meet catastrophic health payments. The control group in column 4 is further restricted to the HB whose head was not sick or injured. Models 5 and 6 focus on time costs; column 5 restricts the control group to the population of HB owners who missed no days of work in the initial period. Column 6 further restricts to households not coping with catastrophic OOP health expenditures.

The literature on health commonly uses a 10% threshold for what is considered “catastrophic” health expenditures related to household income. While this might be empirically justified, this cut-off point certainly calls for alternative specifications, in our case to check the robustness of the monetary impact of health shocks. An alternative threshold of 20% for indicating catastrophic health expenditure is thus used. In order to obtain an overall effect rather than binary indicators, I also use a continuous variable measuring the ratio of health expenditures at the household level divided by the business income. Results are reported in table 8. Coherently with the previous estimations the sample includes all households having no catastrophic OOP health expenditures in the first period. The first model uses a 20% threshold to define catastrophic OOP expenditures and finds a stronger effect on HB income than with the 10% one. All other models use the continuous variable indicating the amount that HH health expenditures represent when compared with the business income-generating capacity. The effect is estimated on all previously used outcomes, including expenditures in the business and investment. Both the crowd-out effect and the decreased investment are robust to this alternative specification.

Table 8. Alternative health expenditures variables and HB activity.

	(1) HB income	(2) HB income	(3) Total expenditures in the HB	(4) Expenditures materials	(5) Total intermediate consumption	(6) Investment
Catastrophic exp. (20%)	-0.564*** (0.120)					
Proportion of health exp.		-0.502*** (0.126)	-0.549*** (0.181)	-0.905*** (0.263)	-0.337** (0.157)	-0.106** (0.050)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,446	1,446	1,446	705	1,435	1,446
R-squared	0.164	0.182	0.074	0.113	0.049	0.029
Number of idupi_d	723	723	723	423	722	723
Regions*time	Yes	Yes	Yes	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Two last types of robustness checks were conducted, results of which are not reported. First, as the health shock measure combining illness or injury and missing days at work could be considered not restrictive enough, a second variable using a higher threshold (missing more than 5 working days after a health shocks) is employed. Second, informal insurances may play a role at the commune level. Assistance between community members could partially offset the effects of illness, by sharing time and monetary costs. The results were re-estimated using, on the one hand,

standard errors clustered at the village level and, on the other hand, village-level fixed effects. All robustness checks yield converging results in terms of significance level and amplitude.

7. Discussion

The effects of health shocks on HBs evidenced in this study are large. To answer concerns that they may in fact be too large, it should be recalled that they represent conservative estimates as regards several potentially remaining sources of bias, and that they are robust to various measures of health shocks and outcomes. Furthermore, the choice of dealing only with health shock rather than lasting conditions and/or chronic events is likely to further restrict its magnitude: chronic diseases could have an even larger effect, noticeably on business survival. But beyond technical considerations, one question raised by the magnitude of the effects is the extent of the “social cost of sickness” that they imply. In view of the size of the household business sector in Vietnam, the loss of income *not generated* by these production units because of the direct and indirect costs of health problems would yield impressive figures. The opportunity cost of the profits further not realised because these units were deprived of investment as a result of past illness episodes must be added to the total. The counterfactual case where sickness, being perfectly insured, would represent no direct cost for households bears by contrast large economic gains –even though this scenario implies increased social contributions.

At the household level, the severity of the income loss due to the effects of health shocks on HBs depends on two parameters. The first one is the importance of the HB in the income structure of the household. Most of the HBs of our sample are operated as individuals’ primary activity (81%). This income could nevertheless be a complement to other family members’ wage. It turns out however that the HBs in the sample are the main income source of most of the households: the non-farm HB income weighs on average 87 per cent of the total household income in the initial period among the non-sick households. The second parameter is the durability of the impact on the HB: the decrease in income could indeed reflect a temporary loss. The translation into permanent income loss is however likely to stem from the marked effect on business survival, and from the documented decrease in investment. Additional investigations on these two parameters would require a longer observation span, in order to verify (1) that the impact on the HB translates into a decrease in total household income in the next periods, and (2) the capacity of HBs affected in the past to economically recover, and eventually compensate

for underinvestment. The data limitations, both in terms of number of observations and time periods, do not allow these assumptions to be tested.

A possibly surprising finding is the absence of mitigating effect of the health insurance variables. Insurance coverage should, by definition, reduce the OOP burden on households –even though at the time of these data, the inclusion of the informal sector into the voluntary schemes was still marginal. Yet, health shocks have comparable consequence on HB operators who are insured and on those who aren't. The insurance status of other household members does not have more influence. Two pieces can help solve this puzzle. First, despite recent progress of the health insurance system, the OOP share of total expenditures remains persistently high in Vietnam (World Bank, 2014). There is no cap on co-payment expenditures, and as the Social Security's reimbursements do not fully cover the benefits, providers increase OOP expenditures for patients. The second reason has to do with possible deficiencies of the social health insurance scheme. Most of the individuals in the sample who are insured are covered through social assistance programs, e.g. because of being officially classified poor households. The associated free health care was known to come with accessibility problems, which could explain why in case of serious illness patients would still seek care outside the range of covered services. Palmer *et al.* (2015) found the social health insurance to have no significant impact on health expenditures in the period 2006-2010 at the individual level, although it increased the probability to seek treatment. Health insurance could nevertheless have a mitigating effect *via* two extra channels. First, if its positive effects on health outcomes are true, *via* increased inpatient and outpatient visits in case of sickness. Second, if health insurance decreases the perceived risk of facing catastrophic expenditures (even though it possibly has no real effect on actual OOP payments). This risk could indeed impact investment on its own, even though no health shock is concretised.

Finally, the question of the external validity of these results can be raised. The specificities of Vietnam in terms of health care financing, and the resulting importance of out-of-pocket health expenditures in the households' budget could explain the size of the impacts found. Health shocks possibly have bulky monetary costs in many other countries, but the specificities of each health system might shape a different response of the household business population. While the magnitude of effects could vary, the point made on the general vulnerability of HBs to health problems is however fairly general.

8. Conclusion

Not only households, but also the businesses they operate, are vulnerable to health shocks. This study evidenced a significant and severe causal impact, building on an innovative dataset from a nationally representative Household survey. Catastrophic health payments within the household are the main driver of this effect, whereas labour substitution seems to mitigate the decrease in labour inputs. Whether or not the operator is him/herself sick, large and unexpected health expenditures strongly affect the HB income. Budget-constrained households substitute health payments to the expenditures dedicated to their business, resulting in a significant underperformance. More importantly perhaps, the propensity to invest is negatively affected and the growth capacity is undercut; transitory shocks could thus alter into permanent ones.

The monetary shock associated with ill health events undercuts the capacity of household businesses to generate income and grow. Health is a major, yet underestimated, vulnerability factor for the countless microenterprises that operate in an already risky environment.

Why are the consequences of health problems on household businesses a key problem in the developing world? The informal sector is the number one employer outside agriculture in many countries: hundreds of millions of individuals around the developing world generate income through non-farm microenterprises. Despite industrialization, the household business sector absorbed in Vietnam the majority of the labour force increment over the past years (Oudin *et al.*, 2014). Survival activities coexist with top performing micro businesses reaching a sophisticated level of organization, but all operate in a risky environment. Considering their number and the fact that they are the main source of income for a large share of the poor and near-poor households, HBs are undoubtedly a key to promoting inclusive growth. The results of this study throw a light on an underestimated –yet powerful– mechanism that adds up to their general vulnerability. Health care financing strategies that place considerable emphasis on out-of-pocket payments were upheld in LMICs since the late 1980s (McIntyre *et al.*, 2006), and especially in Vietnam. By promoting user fees for public sector health services and increasing the role of the private for-profit sector, they are likely to have had adverse consequences in the light of the above results.

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Chapter 3

Can Insurance Mitigate Household Businesses' Vulnerability to Health Shocks?

Abstract

Household Businesses (HB) are vulnerable to health shocks affecting all members of the household to which they belong. The monetary costs of these shocks affect HB revenue and investment. Health insurance, by offering financial protection against catastrophic health expenditures and increasing health care utilisation, should mitigate this specific vulnerability. A 2005 reform giving free health insurance to children under 6 in Vietnam introduced a discontinuity in the coverage of children, and lets evaluating the influence of insurance in this regard. The change allows comparing otherwise similar household businesses that differ only by the proportion of insured children in the household. The results show that health insurance did not decrease health expenditures, and neither increased the number of days during which the HB operated. The potential of health insurance to mitigate the effect of health shocks on informal microenterprises is conditional on the actual level of financial protection offered –which was low in this context. I nevertheless evidence a potential *peace of mind* effect: health insurance can stimulate investment, at least temporarily, even while no actual mitigating effect exists.

1. Introduction

Informal sector workers are largely unprotected against the consequences of ill health events. They sometime benefit from the extension of another household member's insurance, or from the continued benefits of a previous formal job, but are only marginally enrolled through these contributory schemes that are by nature restricted to public or formal-sector workers. They are more commonly enrolled through their inclusion in social assistance programs, which extend social protection to vulnerable groups defined on the basis of income, location or ethnic classifications. But many developing countries, and Vietnam among them, face a problem of "missing middle" on the road to universal social protection. The inclusion of microenterprise owners is plagued by the absence of employment-based contributions, and the limitations of voluntary insurance schemes (Nguyen & Knowles, 2010).

Household Businesses (henceforth HB, considered as microenterprises) are, at the same time, particularly vulnerable to the consequences of health shocks. As showed in the previous chapter, health shocks within the household affect household businesses' activity mainly through increased Out-of-Pocket (OOP) health expenditures, while only marginally through time costs (days spent by the business owner physically diminished or care-giving). The entanglement of HBs in the household's (HH) budget exposes them to the crowding-out effects of large health expenditures. In this frame, Health Insurance (HI) may exert three types of positive externalities. First, provided it fulfils its essential risk-pooling role, HI should decrease the OOP health expenditures following sickness events. There would be in this case a straightforward positive effect on business income, as insurance would prevent the negative effect of sickness episodes evidenced in the previous chapter. In other words, one can expect a positive effect of health insurance on household business income when evaluated against uninsured individuals, provided that both face similar incidence of illness. Second, as long as health insurance increases the probability to seek treatment, it might reduce the time costs of sickness. If the HB owner is affected, h/she will recover faster. If another household member is affected, the HB owner will spend less time caring on average. These time costs are showed to have a lesser impact on household businesses, but could nevertheless play a role. Third, HI could reduce uncertainty. Even in the hypothesis where it has no impact on actual OOP health expenditures, it could reduce the expected expenditures level, and contribute to lessen the risk perceived by HB owners. If investment depends from the perceived risk, HI could thereby stimulate the acquisition of productive assets. In other words, HI could stimulate investment in the households

owning a HB by decreasing precautionary savings. Overall, to the extent health shocks could translate into permanent income loss by threatening the households' capacity to generate income, a large growth potential could lie in implementing efficient insurance mechanisms.

The primary objective of this study is to empirically investigate the effects of HI on household businesses, considered as production units. The only type of vulnerability considered is related to health problems: I investigate the links between HI and HB income, number of days of activity, and investment. This investigation rapidly faces an obvious endogeneity problem. The health insurance status of individuals within a household is associated with a set of unobserved characteristics that might drive HB outcomes. In particular, if self-selection into insurance were playing some role, enrolment would be more frequent among individuals with a higher incidence of illness (resulting in a negative association with HB outcomes). The direction of the bias is not straightforward as better-informed individuals may also be more educated, have larger incomes, and are more often insured. Taking stock, this study exploits an exogenous variation in the HI status of household members: the full coverage of children under six that was implemented in 2005, and created a discontinuity among HB owners in the proportion of *other members from the same households having HI*.

A decree³³ was promulgated on March 17, 2005 to provide all children under 6 years old with free health insurance cards, in order to facilitate their access to public health services. The government is since responsible for fully subsidising their health insurance premium. Specifically, health facilities are reimbursed after listing the services provided to children, and submitting it to the provincial health bureau. The decree provided instructions on budget estimations for health care services based on the number of children in each locality, which were submitted to the department of finance of the Ministry of Health for budget allocation. Provinces with difficulties were directly supported by the central budget. The reform had immediate effects, as many localities used birth certificate to decide on children's benefits even when health insurance cards were not yet issued (UN ESCAP, 2009). A preliminary assessment by the Ministry of Health in 2006 found a sharp increase in the number of children under six visiting health facilities (MoH, 2007). Further evidence on the uptake of children under six after the intervention is found by Palmer *et al.* (2015) who evaluate the impact of HI enrolment on health utilisation of children and health expenditures of households.

³³ Decree No. 36/2005/ND- CP

This reform introduced a discontinuity in the health insurance coverage of children by giving free HI to children under six. By contrast, children from 6 to 14 years old are not automatically insured, and have access to two different health insurance programs: the voluntary scheme for students, and the free health insurance for vulnerable groups (poor households, ethnic minorities or households with merit). Figures from 2006 show that less than 63 per cent of children aged 6 to 14 had health insurance, which contrasts with the rate for children under six of close to 90 per cent. The discontinuity remains however fuzzy, using the RDD terminology: despite impressive changes, some children under six remained unprotected while more than half of children over six are enrolled through other schemes.

Among household businesses taken as production units, the focus of this paper, the reform similarly introduced a discontinuity in the proportion of children covered in the household to which they belong. The age of the youngest child of the HH can be used as a local instrument for the proportion of children enrolled to investigate the link between health insurance status and HB outcomes. Even though the reform does not provide an exogenous variation of the health insurance status of the HB owner himself, it offers identification based on the coverage of young children who, being often prioritised (Eisenberg & Freed, 2007), are an important part of the households' total health expenditures. This strategy is largely based on the fact that the vulnerability of HBs to health evidenced in section 2 is true at the household level: the total OOP health expenditures matter when crowding out business-related expenditures, not only those of individuals employed in the HB. The approach of this study is accordingly to evaluate the effect of children enrolment on household business revenue (as it is supposed to reduce health OOP expenditure and the HB vulnerability to their crowding out potential), HB days of activity, and household investment. The following section reviews the related literature; section 3 presents the data and empirical strategy, section 4 describes the results, and section 5 the robustness and sensitivity tests.

2. Related literature: the effects of health insurance among informal sector workers

The aim of this section is to provide a targeted literature review on the effects of health insurance and their potential links with household businesses.³⁴ To the best of my knowledge, no research exists at this point from the perspective of household businesses as production units. The related papers summarised hereafter rather relate to (1) the effects of HI on health care utilisation, health status, and financial protection of individuals and households, with a focus on young children and the Vietnamese context; and (2) the specific effect among informal sector workers. While none describe the effects on the microenterprises themselves, the closest strand of literature is indeed the evaluation of the effects of health insurance on individuals working in the informal sector.

In the vast literature on health insurance, most of the existing studies relate to its effects on health care utilisation, health status, and financial protection. Understandably, the results depend heavily on country-contexts, and especially on the features of the health insurance schemes. Giedion *et al.* (2013) provide a comprehensive review of this topic, which points toward a robust link between health insurance coverage and access to health care across low and middle-income countries, while the improvement in health status is less marked. Among the papers dealing with these outcomes, many underline the specificity and importance of young children. In Thailand, Gruber, Hendren & Townsend (2014) find that the extension of HI significantly reduced infant mortality. In Ghana, Gajate-Garrido & Ahiadeke (2015) show that HI has a positive impact on health status through the fact that parents become more active users of child curative care. In Rwanda, Woldemichael & Shimeles (2015) found a positive effect on utilisation, especially marked for under-five children. As regards the third angle of interest, financial protection, the main question is the extent to which it reduces OOP health expenditures, and in particular catastrophic OOP health expenditures. In the same context of Ghana for instance, Kusi *et al.* (2015) document a significant reduction in expenditures. But overall, varying degrees of financial protection across schemes and countries are found (Giedion *et al.*, 2013).

The specificities of Vietnam and the data availability led to several recent contributions on these issues. Increased health care utilisation by young children,³⁵ following the same 2005 reform

³⁴ For a broader review on the health insurance in LMIC the reader can refer to Ekman (2004) or Lagarde & Palmer (2009), especially for community-level health insurance.

³⁵ Evaluations among adults include Jowett, Contoyannis & Vinh (2003); Sephiri, Sarma & Simpson (2006); and Wagstaff (2007).

analysed in this study, is found by Nguyen & Wang (2013) with a diff-in-diff specification, by Palmer *et al.* (2015) who rely on a similar fuzzy discontinuity, and by Nguyen C. (2016) on children aged 6-14 using fixed-effects specifications. However, evidence on the degree of financial protection is mixed on this population; Palmer *et al.* (2015) find no effect on expenditures,³⁶ while Nguyen C. finds a mitigating effect for the free health insurance program only.

Besides the overall effects on health insurance on adults and children, the angle that provides the most relevant insights given the focus of this paper is the specific case of informal sector workers, which is the object of several recent contributions. This angle is of particular interest given the recognised vulnerability of these workers and the challenge that they represent for universalising social protection. All papers are based on the extension of some existing schemes that aimed at including informal sector and/or informally employed workers. In Peru, Bernal, Carpio & Klein (2014) exploit a discontinuity to show that access to health insurance for the informally employed increased utilization of health care, and willingness to pay for non-covered services (as total health expenditures increased). The case of Nicaragua provides an overall similar picture as informal sector workers increased health care utilization and individual health care expenditures (Thornton *et al.*, 2010). A broader perspective is given by the review of Acharya *et al.* (2012), who examine the effects of HI for informal sector workers on health care utilisation and financial protection. Nine studies, out of fifteen that are using utilization as the outcome variable, find a positive effect. Yet only four out of sixteen conclude to a reduction in OOP expenditures for the insured. It seems that even when HI does reduce OOP expenditures per visit among informal sector workers, the increase in care-seeking behaviours reduces its potential mitigating effect on (catastrophic or not) OOP health expenditures.

From the existing evidence on the effects of HI (in particular in Vietnam and among children), one can expect that households with more insured individuals would utilise more health care while not necessarily spending less. This is also true when looking at the studies focusing on informal sector workers, and at policy reports stressing the persistently high share of OOP expenditures in Vietnam (e.g. World Bank, 2014). It is worth stressing again that all existing

³⁶ An interesting perspective is given by Sepehri (2014) for the adult population: the use of the insurance card, rather than enrolment in itself, is the real discriminating factor and does reduce significantly OOP expenditures by more than 50 per cent (with some heterogeneity by health facility). In the case of children however, as mentioned in the introduction, birth certificates were sufficient to benefit from the newly-established free health care policy.

studies adopt the perspective of workers as individuals; none looked at the direct effects on their microenterprises. These results however let anticipating various potential channels through which HI could matter from a HB perspective. As the causal effect of HI on OOP expenditures is for the least blurred, there is little possibility that variation in the coverage of children will mitigate the crowding out effect of health shocks. The positive effects on utilisation might, however, mitigate the time lost to illness (as children recover quicker and HB owners thus spend less time caring), but the time cost has been showed to be a minor channel of influence on HB outcomes. Accordingly, there should be no -or little- effect of health insurance on HB revenue or time in activity.

An additional possibility is that enrolment in health insurance stimulates investment. Indeed, recent work (in progress) by Chemin, Haushofer & Jang (2016) using a randomized controlled trial among informal sector workers in Nairobi suggests that *“the effect of insurance on welfare is primarily a “peace of mind” effect”*. Insurance is found to improve psychological well-being more than consumption smoothing. Accordingly, it is possible that variation in the share of individuals covered within the household does affect the perceived level of risk (e.g. by decreasing the expected OOP expenditures). As HB investment is known to be linked with anticipated expenditures (Huegerich, 2012), this could lead to stimulate investment in the short run.

To sum up, we do not expect children’s enrolment in health insurance to efficiently cover households against catastrophic OOP expenditures (and by extension, neither their business). The documented increase in utilization of health care should have at best a limited effect on HB outcomes, as time costs are not a significant channel of influence of health problems. However, it is possible that insurance stimulates investment by mitigating the subjective risk perception of HB owners.

3. Empirical strategy

This paper aims at evaluating the impact of health insurance coverage within the household on a set of outcomes related to the household business: the explanatory variable is the health insurance status of children in the household, and the outcomes are the HB variables that can (or should, under the hypothesis of perfect insurance) depend from HI coverage. First, I take the total revenue generated by the HB. It is severely decreased in case of health shocks; if health insurance does mitigate catastrophic expenditures, coverage of the household members should have a positive influence. Second, in order to check this contingent mitigating effect on expenditures, the total OOP health expenditures at the household level are also taken as outcome. Third, to the extent health insurance improves health outcomes by increasing the frequency of treatment, it should translate into an increase in the number of days in activity of the HB if they spend less time caring. Fourth, I use a proxy of investment measured as strictly positive fixed assets expenditures at the household level.

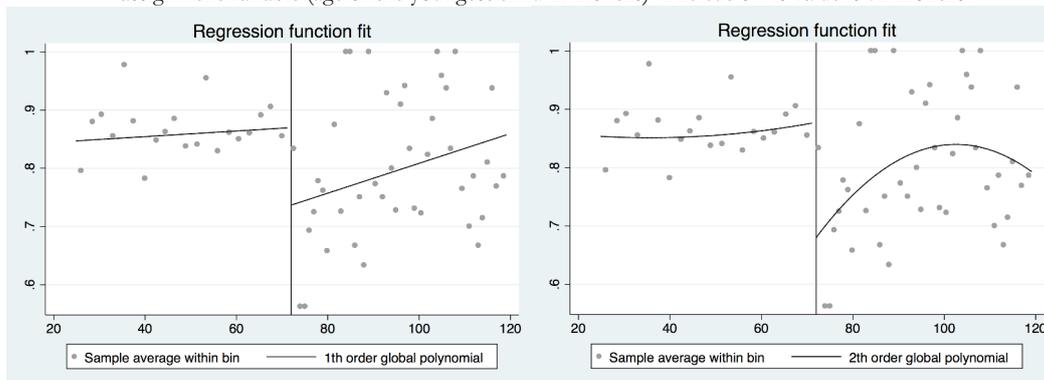
This evaluation relies on an exogenous variation in children's enrolment after the 2005 reform, which introduced a discontinuity in the number of children covered within each household based on children's age. The principle of regression discontinuity (RD) is to rely on a perfectly observed "assignment" variable, of which a certain cut-off value determines a jump in the conditional mean of the "treatment" variable. The "treatment effect" is thereby estimated in the neighbourhood of the cut-off; this exogenous variation mimics a local random assignment of observations. This process can also be understood as a (weighted) instrumental variable model with an endogenous regressor, and a single excluded instrument (the treatment indicator based on the assignment variable being lower than the cut-off). Denoting Z the assignment variable (in our case, children's age) and Z_0 the cut-off (6 years old, or 72 months), the treatment T (health insurance coverage) takes the value 1 if $Z \leq Z_0$ and 0 otherwise.

This identification strategy requires detailed information on household businesses and the other individuals of the same household. The data on which this paper is based is an original sample of household businesses built from the Vietnamese Household Living Standard Survey (VHLSS). The observation unit is the household business; and each HB is matched with information at the household level on health, health care utilisation, number of children, and health insurance coverage.³⁷ Since the reform was introduced in 2005, the closest survey wave of 2006 is used to

³⁷ More details on the survey are given in the previous chapter.

evaluate the effects of the reform in the short term (and other waves are used as falsification and durability tests). Only the 2,149 household businesses belonging to household having at least one child under 12 were kept in the sample. The upper limit of 12 years old was set in order to let an equal number of years before and after the cut-off (6 years old) to be included in the bandwidth. A specificity of this approach lies in the possibility of having multiple children (and thus, multiple treatments) per households. This gives an opportunity to directly take into account an intensity of treatment. Indeed, it lets using as indicator the *proportion* of children having health insurance in the household. To the extent household business outcomes depend from health insurance of children in the household, it is necessary to measure the effects relatively to the number of children, and the proportion of children covered.³⁸ In order to include households with unique as well as multiple children, I define the proportion of children covered as the (main) treatment variable, and use the age of the youngest child as the assignment variable. The degree to which the proportion of children covered depends on the age of the youngest child is depicted in figure 1, which clearly shows using a 48 months bandwidth that the youngest child being aged less than 72 months determines the proportion of children covered by health insurance.³⁹ Dots indicate local sample means, and the underlying local regression functions are traced using linear and second order approximations. Higher orders were also used, and provide similar graphical evidence of a clear discontinuity (figures are not reproduced).

Figure 1. Discontinuity plot of treatment (proportion of children having health insurance in the household) versus assignment variable (age of the youngest child in months). The cut-off is value is 72 months.



³⁸ It is possible, however, that the difference rather lies in a dichotomous approach indicating whether all children are covered or not, which is used as robustness test.

³⁹ In order to check the influence of the reform on the proportion of young children covered, this figure can be compared with figure 2, which provides a similar plot for the year 2004 (pre-reform).

The causal effect of health insurance can be obtained for each outcome by estimating local linear regressions on both sides of the 72 months cut-off, and taking the difference between the two estimates. A “sharp” RD design would have the probability of treatment jump to one, but with “fuzzy” RD designs such as this one the effect would be a local Wald estimator, with a ratio of the jump in the outcome on the jump in the conditional mean of treatment. An alternative way to specify the relationship which let accounting for the effect of other control variables in the probability of having health insurance is to rely on the above mentioned instrumental variable model. The first-stage estimation becomes:

$$HI_i = \alpha_0 + \alpha_1 T_i + \alpha_2 D_i + \alpha_3 (T_i * D_i) + \alpha_4 X_i + \varepsilon_i \quad (1)$$

Where the observation unit i is the household business (and thus a microenterprise, not an individual); HI_i is the proportion of children having health insurance in the household to which the HB belongs, T_i an indication of treatment (age of the youngest child in months lower than 72), D_i a measure of distance from cut-off (difference between 72 and the age of the youngest child), and X_i a set of controls related to the household and the HB. Regressions are weighted to account for proximity to cut-off and restrict to a bandwidth (discussed below); households whose children’s age is far from 6 years old are assumingly less resembling each others. The second-stage lets estimating the unbiased effect of children’s health insurance on household business outcomes:

$$Y_i = \beta_0 + \beta_1 \widehat{HI}_i + \beta_2 D_i + \beta_3 (T_i * D_i) + \beta_4 X_i + \varepsilon_i \quad (2)$$

Where Y_i is the HB outcome, and the regressions use again weights to account for distance. This identification strategy relies on a set of testable assumption, which are discussed below. An important one is that individuals are comparable near the cut-off point; in other words, that the household businesses that are compared do not differ, but by the age of the youngest child. Table 1 provides descriptive statistics and mean equality test in this regard.

Outcome variables as well as household- and HB- related background variables are described and compared by group (without weighting to account for proximity to cut-off) using all households having children⁴⁰ from 0 to 12. If treated and untreated HBs are similar near the cut-off point, then data can be analysed as if it the assignment was conditionally random. The investment

⁴⁰ Young children in the household do not necessarily have a strict parentage with adults. They can belong to the extended family, but are considered dependent as soon as they live together.

dummy (probability of non-zero expenditures in fixed assets by the household), and the total yearly income of the HB (in natural log) are not significantly higher among HBs whose children have a higher probability to have free health insurance. They neither operate more days per month, as both groups are active on average during 24 days. However, eligible households whose youngest child is aged less than 6 do spend more for health care (which, if having an influence at all, should increase the effect of health insurance). Turning to the household characteristics, they logically are larger households (5.4 against 4.8 individuals), and the HB operators are one year younger than non-eligible households (38 against 39 years old). Other household characteristics, as well as the HB variables, are similar across groups and show no significant differences. HBs are comparable by size, type of premises and informality status (defined as having no business license, as for nearly 80 per cent of observations); HB operators have comparable education levels, and are as often males (44 per cent).

Table 1. Descriptive statistics of household businesses by treated (youngest child's age < 72 months) or untreated status.

	Youngest child < 6 y.o.	Youngest child ≥ 6 y.o.	t	p>t
Outcome variables				
Investment dummy	0.18	0.16	1.19	0.24
HB income (log)	9.57	9.65	-1.36	0.17
HH OOP health exp. (log)	6.58	6.25	5.78	0.00
HB days of operation	23.71	23.79	-0.27	0.78
Controls				
Size: 1 (OAW)	0.63	0.65	-0.61	0.55
Size: 2-4	0.33	0.32	0.21	0.83
Size: 5+	0.04	0.03	1.02	0.31
Premise: non-permanent	0.15	0.17	-1.42	0.16
Premise: home	0.57	0.53	2.11	0.04
Premise: dedicated	0.27	0.30	-1.16	0.25
Informal	0.78	0.78	0.34	0.73
Ethnic: not Kinh	0.09	0.09	0.38	0.71
Urban	0.31	0.35	-2.06	0.04
HH size	5.39	4.75	9.11	0.00
Age (HB head)	38.07	39.41	-2.92	0.00
Sex: male	0.44	0.43	0.27	0.79
HB head educ <primary	0.18	0.15	1.58	0.11
HB head educ Primary	0.33	0.35	-0.79	0.43
HB head educ lower sec.	0.32	0.31	0.24	0.81
HB head educ upper sec or more	0.17	0.19	-0.86	0.39
Red river delta	0.21	0.19	5.00	1.17
North East	0.13	0.13	0.40	0.10
North West	0.03	0.03	0.60	0.14
North Central	0.10	0.11	-2.10	-0.50
South Central	0.09	0.13	-11.70	-2.72
Central Highlands	0.05	0.06	-4.10	-0.96
South East	0.14	0.14	1.90	0.44
Mekong Delta	0.24	0.21	5.60	1.30

4. Results

The identification relies on a 2005 reform, whereby children under 6 were given free health insurance. This led to an exogenous variation in the proportion of children covered by health insurance in each household. It lets comparing otherwise similar household businesses, which differ by the proportion of children having health insurance in the household. This study thus evaluates the effects of an increase in HI coverage on household businesses operations, using a sample of household businesses constructed from a 2006 survey and matched with information on the number of children and the health insurance status among household members. This evaluation is done on the overall revenue created by the business, the number of days operating, and the propensity to invest.

The first result corresponds to the estimation of equation (1), taking the proportion of children having health insurance in the household as outcome.⁴¹ Results are provided in table 2, using a bandwidth of 48 months: only households whose youngest child is aged between 2 and 10 are kept. As in Palmer *et al.* (2015), this eliminates the influence of infants aged 0-2 years, who are specific as regards health care, in the main results. Flexible bandwidths are used in the sensitivity analysis in section 5. The assignment (youngest child being aged less than six) does increase the proportion of children covered by 17.4 per cent, significant at the 1 per cent threshold. Other influential factors among HBs or household background characteristics include the education level: individuals reaching higher secondary or more are significantly more likely to get health insurance for their children. Information may also be at play when explaining the significantly higher proportion of children covered for households in urban areas. Households operating their business informally, by contrast, have a significantly lesser proportion of children covered.

⁴¹ That is, for each household business, the total number of children having health insurance from all possible schemes divided by the total number of children under 12 living at the same place.

Table 2. First-stage estimates: proportion of children having health insurance

	% children covered by HI
T (age < 72 months)	0.174*** (0.042)
Distance to cut-off	-0.004*** (0.001)
Distance * eligibility	0.003* (0.002)
Size: 2-4	0.017 (0.025)
Size: 5+	0.020 (0.052)
Premise: home	-0.012 (0.033)
Premise: dedicated	-0.046 (0.037)
Informal	-0.043* (0.025)
Household head's ethnicity	0.056 (0.045)
Urban	0.054** (0.026)
HH size	-0.003 (0.007)
Age of HB head	0.001 (0.001)
Sex of HB head	-0.026 (0.024)
HB head educ : Primary	0.033 (0.038)
HB head educ lower sec.	0.061 (0.040)
HB head educ upper sec or more	0.109*** (0.041)
Constant	0.677*** (0.087)
Region fixed effects	Yes
Observations	1,336
R-squared	0.069
Robust standard errors in parenthesis	
*** p<0.01, ** p<0.05, * p<0.1	

Turning to the effects of children's health insurance on household business outcomes, table 3 provides the coefficients estimates of equation (2). The same set of household- and HB-background variables is included in the vector X : HB size, informality and type of premise; and household's ethnicity, location, size, age, sex, and education. As one could have expected given the context, and the existing literature of health insurance in Vietnam, it appears that increasing the coverage of children does not protect the HB against the economic consequences of health problems. Household businesses belonging to a household where a larger proportion of children is covered do not face significantly less out-of-pocket health expenditures; neither do they

operate more days per month, as would have been the case if health insurance had an effect on the health status of children and the time spent caring. As a consequence, there is rationally no significant effect on the overall HB income. The significance of the small coefficient of the “distance to cut-off” variable in the investment model would tend to confirm the small structural differences that exist between HBs whose youngest child is relatively far from the cut-off. This confirms the local validity of results.

Table 3. Second-stage: children’s health insurance and household business outcomes

	(1) HB income	(2) OOP exp.	(3) Days	(4) Investment
Children HI coverage (instrumented)	0.311 (0.655)	1.297 (0.813)	-3.651 (3.849)	0.511* (0.276)
Distance to cut-off (age in months)	0.004 (0.003)	0.002 (0.004)	-0.004 (0.016)	0.003*** (0.001)
Distance * eligibility	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Size: 2-4	-0.010* (0.005)	-0.002 (0.006)	0.024 (0.029)	-0.005** (0.002)
Size: 5+	0.941*** (0.068)	-0.047 (0.094)	1.132*** (0.432)	0.005 (0.030)
Premise: home	2.761*** (0.226)	0.115 (0.222)	1.331 (0.895)	0.076 (0.074)
Premise: dedicated	-0.093 (0.088)	0.096 (0.121)	0.705 (0.539)	-0.008 (0.038)
Informal	0.009 (0.097)	0.281** (0.136)	1.788*** (0.595)	0.013 (0.043)
Household head's ethnicity	-0.568*** (0.085)	-0.066 (0.100)	-2.037*** (0.474)	-0.015 (0.037)
Urban	-0.246 (0.155)	-0.573*** (0.180)	-4.174*** (1.030)	-0.016 (0.070)
HH size	0.534*** (0.081)	0.083 (0.099)	2.104*** (0.469)	-0.061* (0.032)
Age of HB head	0.000 (0.021)	0.108*** (0.028)	0.103 (0.121)	0.016* (0.009)
Sex of HB head	-0.005 (0.003)	0.001 (0.004)	-0.021 (0.019)	-0.000 (0.001)
HB head educ : Primary	0.108 (0.070)	0.034 (0.087)	-1.662*** (0.416)	0.038 (0.029)
HB head educ lower sec.	0.070 (0.100)	0.055 (0.134)	-0.177 (0.620)	0.044 (0.042)
HB head educ upper sec or more	0.188 (0.118)	0.147 (0.153)	-0.074 (0.669)	0.001 (0.049)
Constant	9.519*** (0.550)	4.055*** (0.657)	28.268*** (3.282)	-0.255 (0.230)
Region fixed effects	Yes	Yes	Yes	Yes
Observations	1,336	1,320	1,336	1,336
R-squared	0.439	0.018	0.150	

Robust standard errors in parenthesis

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

Even while these results do not come as a surprise knowing the context of health insurance and the results of other studies, they are a case-in-point of meaningful insignificance. Indeed, efficient health insurance coverage within the household *should* mitigate the high vulnerability of HBs to health shocks by financially protecting against their consequences, and reducing the time lost to illness. The absence of influence evidences a low level of financial protection.

An interesting finding is the significant (at 10 per cent) positive effect of health insurance coverage on investment. This can be interpreted in a causal way against the *peace of mind* effect mentioned by Chemin *et al.* (2016): HB owners perceive the environment to be less risky when children have health insurance. This result also raises questions. If insurance offers no significant reduction in expenditures, the increased investment of HB owners has to result from a misperception. One possibility is that the expected level of OOP health expenditures decreases as household members are insured, which lets reduce precautionary savings and acquire more physical assets. As households experience using their health insurance, and its absence of effect on total health expenditures, this “peace of mind” effect should disappear. This is investigated in the next sections, along with the sensitivity of the results to various factors.

5. Robustness and sensitivity tests

The above results can be interpreted in a causal way, but their validity depends on a set of assumptions questioned in this section. First, the robustness of the results to the choice of treatment variable is tested. Second, the results of a set of placebo regressions are provided: a similar regression discontinuity before the reform in 2004, and two placebo cut-off values of children age. Third, I test the sensitivity of the results to alternative choices of bandwidth. Finally, I test the two remaining threats to the identification assumption: the manipulation of the assignment variable (children's age), and a jump in other covariates at the cut-off. All results in this section confirm the validity of the analysis.

The first change in the specification consists in using a binary indication of children's coverage rather than an intensity of treatment based on the proportion. All results were reproduced with a similar approach (using the same bandwidth of 48 months) with a binary treatment variable taking the value one if all children are covered in the household, and 0 otherwise. Indeed, it is possible that children's coverage, and in particular the "peace of mind" effect, plays differently when all children are insured rather than an additional child. Results are provided in table 4. All are consistent with the main specification, as no mitigating effect is found on health expenditures, days operating and household business revenue. The probability to invest is, again, significantly higher (by nearly 52 per cent, and significant at 10%) in HBs belonging to households where all children are insured. The pseudo-continuous variable of the *proportion* of children covered captures in practice a similar influence of health insurance status of children than when using a binary indication of full enrolment.

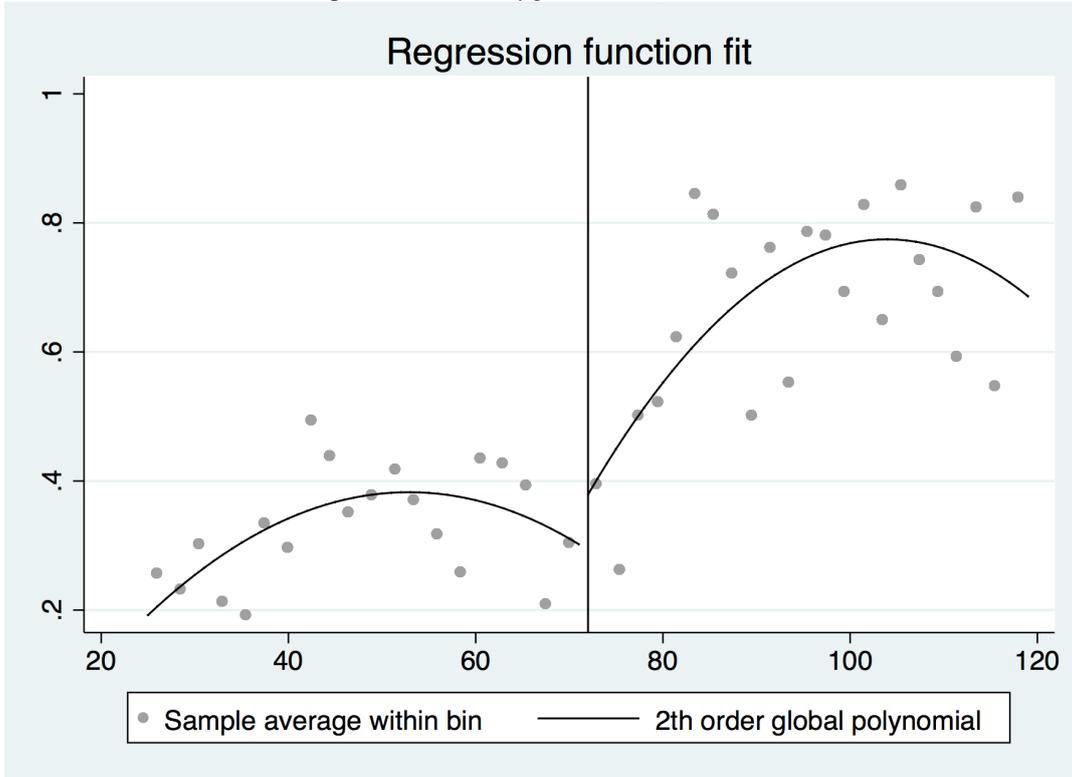
Table 4. RD estimation using a binary treatment of “all children in the household being insured”

	(1)	(2)	(3)	(4)
	HB income	OOP exp.	Days	Investment
Children HI coverage (instrumented)	0.315 (0.664)	1.309 (0.833)	-3.698 (3.919)	0.518* (0.288)
Distance to cut-off (age in months)	0.005 (0.003)	0.003 (0.004)	-0.006 (0.017)	0.003*** (0.001)
Distance * eligibility	-0.010* (0.005)	-0.002 (0.007)	0.024 (0.029)	-0.005** (0.002)
Size: 2-4	0.939*** (0.070)	-0.057 (0.096)	1.163*** (0.437)	0.001 (0.031)
Size: 5+	2.774*** (0.229)	0.168 (0.239)	1.180 (0.934)	0.097 (0.080)
Premise: home	-0.095 (0.088)	0.087 (0.125)	0.730 (0.545)	-0.011 (0.039)
Premise: dedicated	0.009 (0.097)	0.283** (0.140)	1.785*** (0.602)	0.013 (0.044)
Informal	-0.568*** (0.085)	-0.066 (0.103)	-2.040*** (0.478)	-0.015 (0.039)
Household head's ethnicity	-0.238 (0.153)	-0.535*** (0.185)	-4.263*** (1.016)	-0.003 (0.071)
Urban	0.530*** (0.085)	0.069 (0.105)	2.146*** (0.495)	-0.067** (0.034)
HH size	0.001 (0.021)	0.111*** (0.029)	0.093 (0.124)	0.017* (0.010)
Age of HB head	-0.005 (0.004)	-0.000 (0.005)	-0.019 (0.020)	-0.001 (0.001)
Sex of HB head	0.109 (0.071)	0.039 (0.089)	-1.675*** (0.423)	0.040 (0.030)
HB head educ : Primary	0.068 (0.102)	0.047 (0.139)	-0.157 (0.627)	0.041 (0.044)
HB head educ lower sec.	0.182 (0.123)	0.123 (0.163)	-0.014 (0.698)	-0.008 (0.052)
HB head educ upper sec or more	0.191 (0.156)	0.328* (0.198)	-0.922 (0.873)	-0.091 (0.062)
Constant	9.538*** (0.516)	4.140*** (0.618)	28.052*** (3.079)	-0.224 (0.224)
Region fixed effects	Yes	Yes	Yes	Yes
Observations	1,336	1,320	1,336	1,336
R-squared	0.439	0.018	0.150	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The second set of validity tests consists in conducting the same regressions in contexts where the effects are known to be insignificant. These placebo regressions allow verifying that there is no change before the reform took place, in 2004, and that the age cut-off is indeed a source of exogenous variation. The whole analysis was reproduced using the 2004 VHLSS, which involved rebuilding a sample of household businesses matched with household characteristics. Figure 2 plots the proportion of children covered against the age of the youngest child, as done in figure 1 for the 2006 data. The effect of the reform is evident graphically as young children were rarely insured before the reform.

Figure 2. Discontinuity plot for 2004, 2nd order fit.



The same outcomes are used to regress the health insurance status of children, and the results are provided in table 5. All models use similar specifications; they include the same control variables, and region fixed effects. Pre-reform placebo regressions logically yield insignificant effects on all outcomes, including investment. The two other lines of coefficients provide the results of regressions arbitrarily setting the discontinuity at another age threshold in 2006, namely 102 and 36 months, with converging results.

Table 5. Placebo regressions

	(1) HB income	(2) OOP exp.	(3) Days	(4) Investment
Pre-reform (VHLSS 2004)	-0.481 (1.131)	1.313 (1.648)	3.964 (10.483)	-1.240 (0.847)
Cut-off : 102 months (VHLSS 2006)	-0.811 (1.957)	3.832 (3.722)	-1.265 (10.706)	2.242 (1.816)
Cut-off : 36 months (VHLSS 2006)	0.350 (1.131)	0.394 (1.648)	-3.044 (10.483)	-0.305 (0.847)

Robust standard errors in parentheses

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

Third, the sensitivity of results to the choice of bandwidth is tested. There is no absolute guidance in this regard, and the optimal choice is a trade-off between bias and precision, in which common sense (such as restricting to children over 2) plays a role. Indeed, a smaller bandwidth tends to produce lower bias and higher variance; setting a larger value than the 48 months used in the main results could result in some effects being significant. In other words, comparing across a larger base of children's age could lead to conclude that health insurance does have a mitigating effect as more observations are used. Taking stocks, results were re-estimated with an alternative bandwidth of 60 months. Table 6 provides the same results using this bandwidth and an alternative (though equivalent) local Wald estimator. Again, health insurance has no impact on health expenditures, days operating and business income, but it does stimulate investment. The sample size does not let reducing further the bandwidths, as too few observations are left on each side.

Table 6. Variation in bandwidth

	(1) HB income	(2) OOP exp.	(3) Days	(4) Investment
Children HI coverage (instrumented)	-0.592 (1.041)	0.598 (0.927)	-1.620 (4.835)	0.668* (0.360)
Controls & region FE	Yes	Yes	Yes	Yes
Observations	2,149	2,123	2,149	2,149
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Finally, the identification could suffer –as any RD design- from possible manipulation of the assignment variable, and from the cut-off influencing other covariates than the health insurance status. As regards manipulation, if parents misreport the age of children to benefit from free health insurance, and if the individuals who do so are, at the same time, better performing HBs (or more often investing), the previous estimations will be biased. I implement the test provided by Cattaneo, Jansson & Ma (2016), which consists in testing the density of observation near the cut-off point, and concludes to the absence of manipulation. On the other hand, I test possible discontinuity in all covariates at the 72 months threshold (HB size, premise, informality; household's ethnicity, location, size; HB owner's age, sex, and education), as well as on indication of children's morbidity (total number of days spent in bed by children). All results are insignificant, which indicate that no other covariate changes significantly at the threshold. Graphical evidence is provided in appendix.

6. Conclusion and discussion: on the economic benefits of health insurance schemes for the informal sector

This paper shows that the exogenous variation in health insurance following the 2005 reform in Vietnam did not mitigate the vulnerability of household businesses to health problems. It had no impact on the amount of out-of-pocket health expenditures, and neither on the days of activity; overall, it did not lead to a higher HB income (which should have been the case given the large negative impact of health shocks on HBs). Increasing the proportion of children covered nevertheless resulted in an increased investment, which is interpreted as a *peace of mind* effect, i.e. as the households' misinterpretation of the mitigating effects of insurance on OOP expenditures.

These results do not let concluding that health insurance mitigated the financial vulnerability of informal microenterprises to health risks in Vietnam. This is partly linked with the specificities of this context. Indeed, the weak financial protection offered by the Vietnamese health insurance in this period is known (World Bank, 2014), and goes together with other limitations of the system. As estimated by the Ministry of Health in 2006, household expenditures accounted for 61 per cent of total expenditure on health (and public financing for 31 per cent only). User fees were overused and let little hope as to the efficiency of health insurance. The high indirect costs of health care (discussed in the previous sections), and the underfunding of health care facilities that charge higher user fees in compensation were still an impediment to the objective of equity and efficiency of the health-care system. Enrolment, although largely influenced by the reform, was not perfect. It was noticeably undermined by the absence of portability. Migrants children, unregistered in their host location, could only seek emergency care in the health facilities outside their locality of origin. While this is not a technical threat to the results (as migrants are often excluded from the sampling frame of the census, and all subsequent household surveys), it is nonetheless a serious concern in itself for the efficiency of the insurance.

Intrinsic limitations of the Vietnamese health insurance in 2006 aside, the overall external validity of these results is worth discussing. The identification strategy relies on an exogenous variation in the coverage of children only. Even while young children have a special importance in terms of health care and expenditures, it limits the validity of the estimations to HB owners in households having children under 12. The advantage of RD of relying on an observed assignment mechanism comes at the cost of restricting the population. But how specific are HBs belonging to households where children under 12 are present? Part of the answer lies in table 7, which provides descriptive statistics on both populations.

Households where children are present logically correlate with the HB owner being younger. Household businesses subsequently exhibit significant differences on most of the observables: they generate more income, invest more often, and employ (marginally) more workers. Overall, the population used in this study seem to be essentially made of the relatively better-off household businesses, whose vulnerability might be lower. As the estimated effects are local –and restricted to a population of HBs that is overall less vulnerable, the benefits of health insurance could be higher when measured among more fragile microenterprises.

Table 7. Descriptive statistics: comparison of HBs based on the presence of children under 12 in the household

	Sample: have children < 12	No children (or older)	t	p>t
Outcome variables				
Investment dummy	0.17	0.13	3.60	0.00
HB income (log)	9.61	9.48	3.19	0.00
HH OOP health exp. (log)	6.42	6.35	1.63	0.10
HB days of operation	23.75	24.00	-1.25	0.21
Controls				
Size (# workers)	1.65	1.56	2.10	0.04
Premise: non-permanent	0.16	0.14	1.88	0.06
Premise: home	0.55	0.56	-0.63	0.53
Premise: dedicated	0.29	0.30	-0.79	0.43
Informal	0.78	0.78	0.10	0.92
Ethnic: not Kinh	0.09	0.06	3.55	0.00
Urban	0.33	0.39	-3.79	0.00
HH size	5.08	3.87	26.02	0.00
Age (HB head)	38.72	46.07	-21.53	0.00
Sex: male	0.43	0.40	2.00	0.05
HB head educ <primary	0.17	0.18	-0.72	0.47
HB head educ Primary	0.34	0.25	5.90	0.00
HB head educ lower sec.	0.31	0.38	-4.39	0.00
HB head educ upper sec or more	0.18	0.19	-0.85	0.40

Finally, the positive and robust effect found on investment is still puzzling. Households being imperfectly informed about the effects of health insurance but nonetheless rational, they should adapt their behaviours upon experiencing the absence of financial protection. In other words, the positive effect found on investment should be only temporary; as HB owners realise that health insurance of children does not come with reduces health expenditures, they should increase their precautionary savings. In order to check the persistence of this effect, the whole analysis was reproduced on the 2008 data. Being set three years after the reform, HB owners' rationality (but imperfect perception) should result in an insignificant effect on investment (as well as other

outcomes, as the limitations of the health insurance scheme were still valid). This is indeed the case; all previous specifications and sensitivity tests point toward an absence of effect on investment in 2008.

The results of this paper are telling in at least two ways. First, they show that the potential of health insurance to mitigate the effect of health shocks on informal microenterprises is conditional on the actual level of financial protection offered. Second, that the *peace of mind* effect can stimulate investment, at least temporarily, even while no actual mitigating effect exist. These results call for further investigation of the effect of insurance on a broader definition of vulnerability, both at the HB and at the household level. A take-away message of the current findings is that insurance may well be good for informal businesses, but efficient insurance is undoubtedly better.

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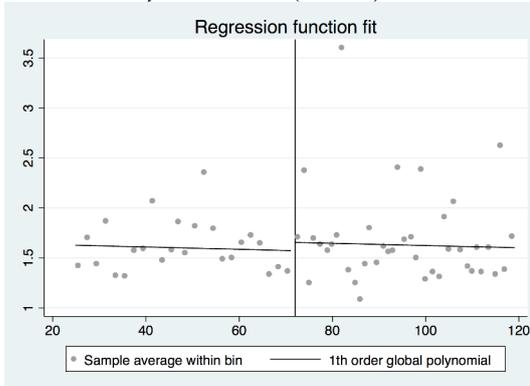
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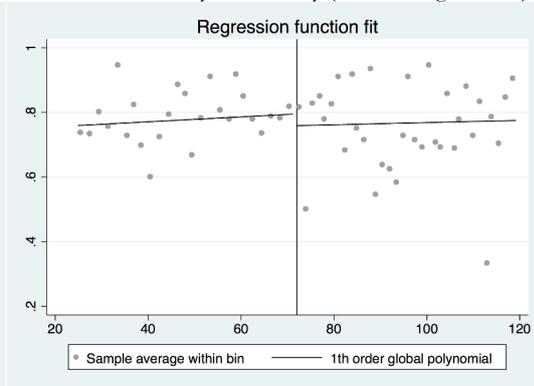
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7. Appendix

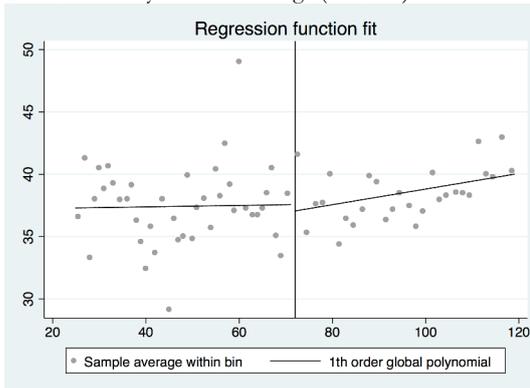
A. Discontinuity: business size (linear fit)



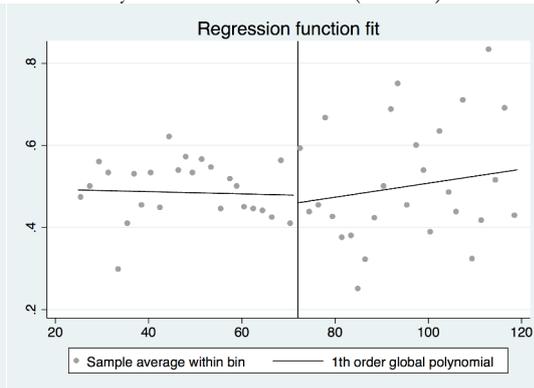
B. Discontinuity: informality (business registration)



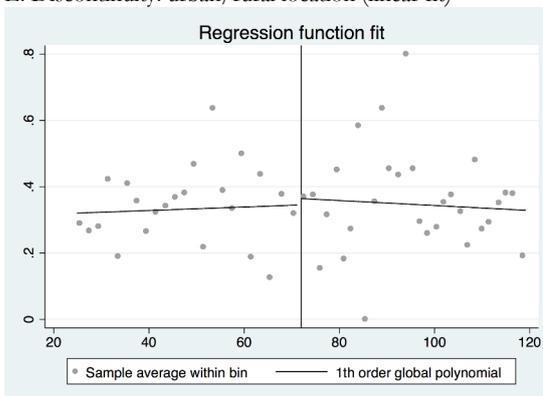
C. Discontinuity: HB owner's age (linear fit)



D. Discontinuity: HB owner's education (linear fit)



E. Discontinuity: urban/rural location (linear fit)



Chapter 4

Does Managerial Capital also Matter Among Micro and Small Firms in Developing Countries?

Abstract

The lack of managerial capital was recently put forward as a constraint for developing countries firms (Bruhn *et al.*, 2010). While established for large and medium firms, its importance for micro enterprises has yet to be proven: evidence found in Development Economics and Entrepreneurial Studies is, at best, mixed. This paper uses a panel of Vietnamese micro, small and medium enterprises to investigate this question in a comparative manner. The data let building a multi-dimensional measure of Managerial Capital, and allows consistent estimates of firm-level productivity. Even though bias might still affect the estimation of the average influence of managerial capital on productivity, I am able to show that this influence is as important for micro firms as it is for medium ones.

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1. Introduction

Neither husband nor wife knew how to read — a slight defect of education, which did not prevent them from ciphering admirably and doing a most flourishing business. [...] To relieve himself of the necessity of keeping books and accounts, he bought and sold for cash only.

Balzac, *Le Curé de Village*, 1841

Few will question the relevance of advertisement expenditures for a multinational manufacturing corporation. More eyebrows may rise upon asking the same question in the case of a single informal sector worker producing rubber sandals. The motivation of this paper is to ask this question, and to do so in a comparative manner: does managerial capital (MC) have the same effect on productivity among micro, small and medium firms? While past and on-going research proved the relevance of managerial capital for large or medium enterprises, the population of micro and small enterprises was largely left aside.

Given the weight of this segment in total employment, and to the extent the long-awaited development process is to occur through productivity gains, it is yet of prior interest to understand the mechanisms that foster (or limit) their expansion. Several types of constraints have already been put forward. Access to savings (Dupas & Robinson, 2013), access to finance (de Mel *et al.*, 2008), and human capital (Hsieh & Klenow, 2009) are among the more documented ones. The lack of managerial capital, by contrast, only recently emerged as such (Bruhn *et al.*, 2010).

Micro, small and medium enterprises (MSME) in the developing world rarely use what is considered elementary business practices in industrialised countries. The majority do not keep basic written accounts, and they compete mostly with other local household businesses. Yet, micro entrepreneurs themselves mention factors such as “keeping and interpreting financial records” or “promoting product” as favouring business success (Bradford, 2007). A segment of enterprises does display high organisational and managerial abilities. This heterogeneity in managerial capital endowment can enter the production function as an additional efficiency factor: it could be argued that even among micro-firms, managerial inputs could improve the productivity of other inputs. Competing more aggressively, advertising products, incentivising the wage determination or innovating could lead to higher value added.

Proving a causal relationship between productivity and managerial capital is challenging, as the latter does not offer exogenous variations. It is rather part of the often-blamed (and ineluctably unobserved) “ability” of the firm’s operator, and any link found with productivity can be attributed to some other unobserved factor. The approach of this paper is accordingly not to argue in the sense of a causal link, which observational data would struggle to back up. It is rather to provide a comparative estimation of the impact of managerial capital on productivity by firm size, using a synthetic indicator of MC and consistent productivity estimates.

To do so, I rely on a panel of Vietnamese MSME that let measuring several aspects of MC. I propose a multidimensional measure of MC based on twelve variables, used to compute a weighted score. I start by estimating the productivity of household firms, controlling for simultaneity and input price bias. I then investigate the effect of MC on firm-level productivity, controlling for unvarying heterogeneity, and testing for heterogeneity of the effect by firm size categories. While larger firms are found to be on average more productive than smaller ones, I find that the effect of MC is still significant –and of comparable magnitude– among the smallest. Micro and small firms that have higher managerial abilities are indeed more efficient than others –and they are *as much* more efficient as medium-size firms. I further investigate the separated effect of the MC indicators and find the effect to be mainly driven by the firms’ ability to compete aggressively.

The remainder of the paper reviews the literature (sect. I), presents the data (sect. II) and the empirical measures of productivity and managerial capital (sect. III). Section IV presents the estimation results of the link between MC and productivity, and section V presents robustness tests.

2. Literature review: what do we know about micro and small enterprises' managerial capital?

What exactly constitutes managerial capital? The notion has no widely accepted definition and necessarily borrows from several fields of studies, which have complementary definitions. As put by Syverson (2011) “*Managers are conductors of an input orchestra*”: defining managerial capital then amounts to measuring the length of the conductor's baton; but it could also relate to the conductor's attitude and psychological traits. In the related literature that recently surged in the field of Development Economics, MC is persistently proxied by business practices (and among micro and small firms, by elementary business skills). The field of Management studies, in which the focus has long been on the managers' influence, also considers additional features of MC that relate to the entrepreneurial spirit. Taken broadly, MC thus refers to all *practices* and *traits* of the enterprise operator that potentially have an influence on the firms' efficiency. As such, it can include formal bookkeeping, inventory management, financial or strategic planning, and pricing strategy; but also innovativeness, or self-confidence.

This section reviews the literature to determine which skills, practices or characteristics can best proxy managerial capital in the case of micro and small firms, and to what extent their influence on performance is established at this point. The Development Economics literature saw a recent surge in business training programs' evaluation, which provided insight into the relevance of some business practices. The following review focuses on whether this literature did succeed in proving the relevance of managerial capital for micro and small firms, rather than on the type of programs that work. On the other hand, contributions are found in the field of Management and entrepreneurial studies, where the relevance of the notion of Entrepreneurial Orientation (EO) among micro firms in developing countries has received recent empirical attention.

A. Business practices in Development Economics literature: mixed evidence from training programs

Interest for the role of the manager recently sparked in the field. A set of papers defined what is considered “good practices” for large enterprises, and proved the effects of these practices on productivity (Syverson, 2011; Bloom *et al.*, 2010, 2013a, 2013b). In the case of household micro and small firms, the picture is fuzzier.

Evidence mainly stems from programs' evaluations. Numerous training programs have been launched to improve microenterprises' business skills around the developing world, and a substantial impact evaluation literature jointly emerged. They cover a large and varying set of skills. The more frequent ones include marketing, advertising, bookkeeping, elaborating growth strategies, financial planning, costing, and suppliers' optimisation. Most of these contributions focus on two types of outcomes: in a first step, they ask whether training programs do improve the skills that they teach, and in a second step whether these programs have, through improved skills, an effect on firms outcome. The first step is a necessary condition to be able to attribute any lasting improvement to the program itself. It is however not sufficient: improving practices *per se* does not provide ground for support policies if no effect on outcomes are found.

Many of the recent papers in this strand yet fall into this category, showing only significant improvements in business practices that do not translate into higher profits, faster growth or improved survival (De mel, McKenzie & Woodruff, 2014, Fairlie *et al.*, 2015; Fiala, 2014; Karlan & Valvidia, 2011; Karlan, Knight & Udry, 2014). Business skills would then be teachable, but it is harder to draw lessons on their intrinsic relevance. Not only the lack of significance, but also the heterogeneity of interventions and contexts described in these studies is at stake. In addition to varying in contents, the programs evaluated differ in terms of target populations, scale, duration, means, and implementation schemes (some are combined with in-cash grants). The population of firms heterogeneous: many studies consequently lack sufficient power to detect any effect on outcomes. Among the studies having sufficient power to detect impacts, two papers found impacts of trainings on short-term profits and sales: Berge, Bjorvatn, & Tungodden (2014) by combining survey data and lab experiment, and De Mel, McKenzie, & Woodruff (2014) by evaluating a combination of training and grants.

A review of this literature by McKenzie & Woodruff (2014), including 20 studies (among which 16 randomized control trials), logically concludes that "*there is little evidence to help guide policymakers as to whether any impacts found come from [...] productivity improvements, and little evidence to guide the development of the provision of training*". A review by Grimm & Paffhausen (2015) also point the lack of power of most of the RCT included: 5 out of the 17 studies on all topics are able to detect effect sizes of 20% and less. This might largely explain why "*the training interventions do not generally succeed in increasing profits*". Cho & Honorati (2014), using meta-regressions, draw a similar conclusion. Programs aiming at improving microenterprises' business skills in developing countries succeed in doing so, especially among youth, but this literature fails to prove that they

translate into an improved growth or profitability. The intuitive assumption that the relevant skills for micro and small enterprises are elementary compared to those of larger firms was however evidenced (Drexler *et al.*, 2014): when comparing two programs, only the effect of the simplest (“rule of thumb”) is much larger among micro-enterprises.

Lessons drawn from a collection of programs evaluations mainly tell which skills can be influenced by training programs. Conditionally on having sufficient power, they subsequently tell whether these programs have an impact on microenterprises outcomes. But most of the programs are small, involving typically 100 to 300 heterogeneous firms. As such, they may be suited to improve the design and provision of future programs in related contexts, but are overall insufficient. Drawing a more general lesson on the importance of Managerial Capital requires going beyond the collection of trainings. Evidence from larger scale surveys could add value in this context (McKenzie, 2011).

B. Entrepreneurial Orientation and micro enterprises performance

Together with business practices, manager’s traits and attitudes could matter. Another topic covered by some business trainings that unsurprisingly found more popularity in Managerial studies than in Economics is the analysis of attitudes and psychological factors. Not only elementary business skills, but also the proactiveness and perseverance of business owners can increase their performance (Glaub & Frese, 2011).

This finding echoes a second and complementary strand of literature on the link between management and microenterprises performance. An equivalent of what is called in the Economics literature “managerial ability”, which relates to attitudes, is the concept of Entrepreneurial Orientation (Miller, 1983; Covin & Slevin, 1989). It can be measured at the firm level along five dimensions: proactiveness, innovativeness, risk-taking, competitive aggressiveness, and autonomy of workers (Lumpkin & Dess, 1996). A recent set of papers aimed at providing empirical evidence on the link between EO and microenterprises performance. In the cases of Mexico, Argentina, Malaysia and the Philippines (respectively Campos *et al.*, 2013; Berrone *et al.*, 2014; Lindsay *et al.*, 2014; Munoz *et al.*, 2015), the results suggest a positive association between EO and performance. Besides converging results, these studies however share numerous and strong methodological shortcomings. First, samples are small, ranging from

151 to 735 observations (for the latter with a 46% response rate) and generally non-random, with on-site or administrative identification of respondents, which likely results in sampling errors. Second, questionnaires are often self-administered or mailed. While this is not uniformly associated with poorer data, the accuracy of the measure of micro and small firms' performance is more questionable. Let alone by the fact that mailing questionnaires requires a fixed address, which many informal microenterprises lack. All of the cited papers rely on self-reported appreciations of performance, using categorical variables, consistency of which is highly questionable.⁴² Further meta-analysis, as done by Rauch *et al.* (2009), is in turn problematic. Among the 53 samples used, the average sample size is just below 270 respondents and only seven papers use a dependent variable that is not a categorical "perceived performance".

Findings from the evaluations of training programs aiming at improving business practices found little significant improvements in performance. Similarly, the empirical investigations on the role of entrepreneurial orientation (which approximates the part of managerial ability related to attitudes) among microenterprises suffer from too many methodological shortcomings to provide convincing evidence. Both aspects of MC are thus far discussed largely separately in the two disciplines, probably because the assumption is that entrepreneurship matters little among micro and small enterprises in developing countries. There is room for a closer look at the link between managerial capital, understood as both practices and traits, and productivity. More specifically, the question raised at this point is the potential heterogeneity of the link between managerial capital and firm's size. The only major contribution in this regard comes again from McKenzie & Woodruff (2015), who look at the influence of business practices in marketing, stock-keeping, record-keeping and financial planning on productivity. Their result, somehow contradicting the lack of effects of business trainings, is that these practices explain as much variation in outcomes in microenterprises as in large firms. The items included in the scorecard on which they rely partly differ from the variables included in this paper (noticeably on entrepreneurship variables). Together with the fact that Vietnam is not among the countries covered, and the different approach I use (relying on panel data and productivity estimates), makes the comparison of both papers useful.

⁴² In general, relying on self-reported *perceived* categorical outcomes is problematic for comparison. In some cases, the very questions used for self-reported *levels* of outcomes are beyond the reporting capacity of many microentrepreneurs, e.g. when asking directly to report the "return on capital employed" or "growth of the company's value" -found in Campos *et al.*, 2013; Munoz *et al.*, 2015.

3. Data

This paper relies on a rich panel data of MSME, including a majority of micro and small informal firms, and several indicators of both business practices and entrepreneurial attitudes. This section describes the survey data used (A) and the construction of the Managerial Capital index (B).

A. The SME panel

I use a panel of household firms, including 5,878 observations of 1,892 unique firms between 2007 and 2013. It is based on the manufacturing SMEs panel data collected in the frame of the remarkably long-term partnership between the University of Copenhagen and Vietnamese research institutes. The project involved the Central Institute for Economic Management (CIEM) of the Ministry of Planning and Investment of Vietnam (MPI); the Institute of Labour Science and Social Affairs (ILSSA) of the Ministry of Labour, Invalids and Social Affairs of Vietnam (MoLISA); and the Development Economics Research Group (DERG) of the University of Copenhagen. The survey has been initially funded by the Royal Embassy of Denmark in Vietnam under the Business Sector Programme Support (BSPS).⁴³ The panel data has been extensively used in academic research (Rand & Tarp, 2011; Rand & Torm, 2012; Rand & Tarp, 2012).

The small and medium enterprise survey has been conducted nine times, more recently in 2005, 2007, 2009, 2011, 2013, and 2015. As the 2015 round is not available yet, and since the questions of interest have changed after the 2005 round, I only use the 2007 to 2013 rounds. The resulting dataset combines four rounds of survey, one every two years. For each round, outputs are available for years n and $n-1$. The sample size for each round is initially around 2,500 firms, from which only household firms were kept in the present sample. Observations present only one year were dropped. The resulting sample includes 5,878 observations.

The surveys were conducted in 10 provinces in Vietnam. The stratification was initially based on the type of ownership, and aimed at reproducing the structure found in the General Statistics Office (GSO) figures, and other pre-existing SME surveys in Vietnam such as Sakai and Takada (2000). A significant share of informal firms was explicitly included, using on-site identification. Further renewal of the sample implied selecting firms from both the new GSO listings and the on-site identified informal firms. As a result, the SME surveys are not representative of the

⁴³ More information can be found at <https://www.wider.unu.edu/project/small-and-medium-enterprise-sme-survey>

informal sector in Vietnam as they are biased towards larger firms, but they rather provide a picture of the Micro, Small and Medium enterprises segment. Since the initial sampling in 2005 was based on a pre-existing survey from 1997, there is also “a slight bias against young, newly established enterprises” (Rand *et al.*, 2004).

A notable feature is the stability of the questionnaire over time. It consists of three modules: (i) a main enterprise questionnaire; (ii) an ‘employee module’; and (iii) an ‘economic accounts module’. Information collected includes firm’s and owner/managers’ characteristics, as well as detailed records of production, sales and inputs. It also includes a rich set of indicators of Managerial Capital indicators in the enterprise questionnaire.

Table 1 provides a description of the sample: number of observations per year, number of firms in each size category, outcome and income levels. It also describes all the control variables that are used in the empirical analysis. Descriptive statistics of managerial capital indicators are provided below.

Table 1. Sample description.

	2007		2009		2011		2013	
	mean	sd	mean	sd	mean	sd	mean	sd
Observations	1,439		1,677		1,538		1,224	
Size: [1,2] workers (inc. owner)	0.22	0.41	0.26	0.44	0.30	0.46	0.30	0.46
Size [2,5]	0.42	0.49	0.39	0.49	0.42	0.49	0.44	0.50
Size [5,10]	0.23	0.42	0.22	0.41	0.18	0.38	0.19	0.39
Size 11+	0.13	0.34	0.13	0.33	0.10	0.30	0.07	0.26
Average size	6.54	7.67	6.42	7.69	5.55	6.22	5.00	4.72
Real value added	251	413	250	418	288	447	224	280
Real capital	1639	4160	1425	2498	2313	5823	1226	1869
Informal (BRC)	0.44	0.50	0.51	0.50	0.43	0.50	0.39	0.49
Premise: residential	0.37	0.48	0.35	0.48	0.33	0.47	0.21	0.41
Premise: production	0.38	0.49	0.44	0.50	0.45	0.50	0.49	0.50
Premise: only production	0.25	0.43	0.21	0.41	0.22	0.42	0.30	0.46
Road access	0.69	0.46	0.73	0.45	0.70	0.46	0.81	0.39
Manager: male	0.68	0.47	0.68	0.47	0.67	0.47	0.68	0.47
Higher secondary educ. or more	0.40	0.49	0.43	0.50	0.45	0.50	0.55	0.50
Sector								
Food and beverages	0.35	0.48	0.35	0.48	0.38	0.49	0.38	0.49
Fabricated metal prod.	0.18	0.38	0.18	0.39	0.19	0.39	0.19	0.39
Wood	0.14	0.35	0.14	0.34	0.13	0.33	0.12	0.32
Furniture, jewellery, music equ.	0.08	0.28	0.07	0.26	0.08	0.28	0.09	0.29
Non-metallic mineral prod.	0.06	0.24	0.05	0.23	0.04	0.20	0.04	0.19
Textile	0.04	0.19	0.04	0.20	0.04	0.20	0.04	0.20

Apparel, leather	0.05	0.21	0.04	0.20	0.05	0.22	0.05	0.22
Other	0.10	0.31	0.11	0.32	0.09	0.29	0.09	0.29

The sample is primarily made of micro-firms. Household businesses of less than five workers consistently represent between 63 and 74 per cent of observations, depending on the year. In addition, 22 to 30 per cent of firms only include one or two workers, that is, own-account workers or employers with a single additional employee. Medium-size household firms are also included; they have up to a hundred employees, and provide a basis for comparison of larger size and comparable status. Informal household firms, defined as having no business registration certificate, represent 39 to 51 per cent of firms per year, which shows that the sampling methodology (and renewal procedure) performed well in including those units, even though no representativeness is claimed. The average size in the sample is 6.1 workers. Less than a quarter of firms operate in premises that are dedicated to production only, which means that the majority operates at home or in shared spaces. More than two thirds of the managers are males, and half of them (averaged for all years) reached an education level above higher secondary. Firms included in the sample are manufacturing, and the main sectors of operations are food and beverages (with 37 per cent of firms), and metal products (19 per cent).

B. A multidimensional measure of managerial capital

Managerial capital, as discussed in section I., relates to all practices and traits of business operators that have the potential to influence the firms' efficiency. An advantage of the SME survey in this regard is to provide a large range of indicators linked with business practices, as well as entrepreneurial attitudes. I use in this study a multi-dimensional measure of MC, based on twelve variables that are found (and consistent) in all survey rounds. These are (1) the use of formal accounts, (2) the use of advertisement means, (3) the pricing method, (4) wage determination mode, (5) hiring mechanisms, (6) the use of outside services, (7) the location and (8) type of suppliers, (9) improvements attempts of products and services; (10) innovation plans for the near future, and finally past innovation in terms of (11) products or (12) processes. The incidence of each indicator by firm size (in terms of number of workers, including the owner/manager) is provided in table 2. The description of these indicators by size is already telling, and lets seeing that managerial capital is increasing in firm size.

First, the bookkeeping variable indicates whether the respondent does “*maintain a formal accounting book*”. Only 9 per cent of firms across years do keep such formal accounts, and the proportion is

strongly increasing in firm size. Among the largest household firms (11 workers or more), the percentage reaches 25 per cent. It should be stressed that this variable captures the existence of a complete set of accounts; a negative answer may not indicate the total absence of books, as firms may keep simple records through personal notes. The difference that is captured is rather between keeping elementary books (or none), and using a complete accounting system. Second, a binary indication of marketing efforts is based on a positive answer to the question “do you advertise your products?”. It mixes as such all practices, from door-to-door information to radio or TV spots. It is kept binary rather than categorical, as media coverage is barely used among firms that do advertise. Almost inexistent among micro firms (where it reaches 1 to 3 per cent), advertisement is less rare among medium firms (7 per cent), but remains scarcely used. Third, the pricing method is a categorical variable indicating whether the firm fixes its prices according to costs, competitors, or bargaining. There is no significant difference by size, and overall three quarters of firms base their decision on costs –precise determination of which is however not always possible among micro firms. Fourth, the wage determination variable indicates if wages are determined following other sectors’ rates, following local competitors’ rates, by individual negotiations, by the paying capacity of the firm, or by none of these methods (which is necessarily the case for almost 15 per cent of firms that have no employee). Most of the medium sized firms indicate using individual negotiations, while micro firms, even among those paying wages, predominantly report no fixed method for determining wages. Fifth, the hiring channel indicates which mean firms favour upon hiring new workers. Formal competitive channels (labour service centres, labour exchanges, newspapers) are still marginal. The overwhelming majority relies on recommendations by friends or relatives, or personal contacts. Sixth, the use of outside services is constructed as a binary indication of whether the firm buys the following services from external providers: market information; information services on technology; tax, audit or accounting; legal advice; human resources advice; or vocational training. Barely any firm among the micro and small ones do so. Even if the percentages increases with size, only 8 per cent of the largest household firms use such services. Seventh, the distance to the main supplier is indicated as whether firms buy all products from the same commune, or whether part comes from within the province, from other provinces, or a significant part from direct import. The smaller the firm, the more local its suppliers are. Even though some firms do import products, it remains a marginal share in their total suppliers. Eighth, the supplier type indicates if a share (more than 10 per cent) of suppliers are households or the State rather than other private firms – which increases for the latter among the larger firms to reach 22 per cent. Finally, the incidence

of all indicators of product improvement, and (planned or past) innovation strongly increase in size. While 46 and 16 per cent of the larger firms improve their products or innovate in terms of processes respectively, the corresponding figures for micro firms are 15 and 3 per cent.

Table 2. Components of Managerial Capital: incidence by firm size

	Formal accounts	Advertisement	Pricing					
			% costs	As compet.	Less th. compet.	Bargain		
[1,2]	0.01	0.01	0.74	0.10	0.01	0.15		
]2,5]	0.07	0.03	0.73	0.09	0.01	0.17		
]5,10]	0.17	0.03	0.78	0.07	0.01	0.14		
11+	0.25	0.07	0.72	0.10	0.00	0.17		
Total	0.09	0.03	0.74	0.09	0.01	0.16		
Wage determination method								
	None	Local enterpr.	Local SOE	Set by auth.	Agric. rates	Negotiation	Paying capacity	Other
[1,2]	0.85	0.02	0.00	0.00	0.00	0.08	0.03	0.01
]2,5]	0.21	0.12	0.01	0.01	0.02	0.43	0.19	0.01
]5,10]	0.02	0.17	0.02	0.00	0.02	0.53	0.22	0.02
11+	0.00	0.18	0.02	0.01	0.02	0.55	0.17	0.05
Total	0.32	0.11	0.01	0.00	0.01	0.37	0.15	0.02
Hiring channel								
	None	Newspaper	Labour exchange	Friends	Authorities	Personnal cont.	Service centre	Other
[1,2]	0.83	0.01	0.01	0.07	0.00	0.08	0.00	0.01
]2,5]	0.25	0.01	0.02	0.34	0.01	0.34	0.01	0.02
]5,10]	0.05	0.02	0.02	0.51	0.01	0.34	0.02	0.03
11+	0.02	0.04	0.03	0.57	0.01	0.26	0.03	0.04
Total	0.34	0.02	0.02	0.33	0.01	0.26	0.01	0.02
	Outside services	Suppliers location			Suppliers type			
		Commune	Province	Country	Import	Private ents.	Households	State
[1,2]	0.01	0.28	0.63	0.09	0.00	0.52	0.38	0.11
]2,5]	0.03	0.16	0.65	0.19	0.00	0.46	0.38	0.16
]5,10]	0.04	0.09	0.64	0.28	0.00	0.36	0.42	0.22
11+	0.08	0.08	0.59	0.33	0.00	0.40	0.38	0.22
Total	0.03	0.17	0.63	0.20	0.00	0.45	0.39	0.16
	Products improvement	Planning innovations	Innovation: products	Innovation: processes				
[1,2]	0.15	0.14	0.02	0.03				
]2,5]	0.29	0.25	0.02	0.07				
]5,10]	0.41	0.37	0.03	0.10				
11+	0.47	0.44	0.03	0.16				
Total	0.30	0.27	0.02	0.08				

The dimensions included in the operational definition of managerial capital thus relate to business skills and entrepreneurship at the same time (in particular to its innovation and proactiveness dimensions). The discriminating power of most of the MC variables is high, with little firms reporting what assumingly constitutes “good” business practices or entrepreneurial behaviours. I build from these variables a synthetic indicator of managerial capital using Multiple Correspondence Analysis (MCA) for each year, which is later used to estimate the effect of MC on productivity. All categorical variables are transformed into dummies, for which all modalities are kept in the MCA. There is often no element to determine *a priori* which modality indicates a higher managerial capital for categorical variables (such as supplier type). Even if there was, it could be changing by firm size. MCA builds a binary indicator matrix that shows the incidence of each axis by firm, which is used to obtain weights from the factorial axis. A firm’s MC score is thus calculated by the weighted sum of its responses, and can be noted:

$$MC_i = \sum_{j=1,\dots,5} D_{ij}W_j$$

where MC_i is the i -th observation’s managerial capital score, D_{ij} the response of unit i to dimension j , and W_j the MCA weight for the first axis applied to category j . Descriptive statistics on the normalised score by year and firm size are provided in table 4. Detailed results of the MCA are provided in appendix table 1. While the contribution of the binary variables (bookkeeping, advertisement, outside services utilisation, and innovation) to the MC index is straightforward, it is not the case of categorical indicators. The MCA results are informative in this regard, as they reveal the direction and intensity of the contribution of each modality to the axis. It turns out that those firms able to find suppliers in other provinces (or other countries, though this case concerns few firms), those for which State-Owned Enterprises (SOE) represent a significant share of suppliers, and those which compete aggressively (pricing “lower than competitors”) have higher MC levels.

The distribution of the MC normalised score, provided in table 3, can be interpreted in relative levels. Units with a higher score display a mix of more frequent business practices (keeping written accounts, using outside services, fixing wage through individual negotiations or relatively to local competitors) and more entrepreneurial traits (advertising, innovating through products or technologies, competing more aggressively).

Table 3. Managerial capital normalised score by year and firm size

	2007		2009		2011		2013	
	mean	sd	mean	sd	mean	sd	mean	sd
[1,2]	-0.863	0.540	-0.834	0.602	-0.682	0.626	-0.846	0.495
]2,5]	-0.049	0.801	-0.012	0.854	0.086	0.801	0.197	0.867
]5,10]	0.454	0.918	0.548	0.882	0.582	1.106	0.534	0.859
11+	0.764	1.184	0.761	1.007	0.617	1.220	0.912	1.238
All	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
d(MC)			0.021	1.020	0.043	1.014	0.017	1.006

The smaller the firm, the lower is the value of the managerial capital index. Micro firms concentrate in the lowest score values, and few reach high levels of MC score. Medium enterprises, which on average 21 workers, rank the highest. The increase is almost linear in size. An additional question is the extent to which managerial capital varies within firms. This is all the more important than part of the empirical strategy uses fixed effects regressions, which use variations in the index for identification. This variation comes from two sources. On the one hand, some firms changed owners between survey rounds. These changes may imply sudden changes in managerial practices. On the other hand, firms may implement changes in practices and/or entrepreneurial attitudes without changing owners. The within-firms variations in MC are reported at the end of table 3, by the yearly average change and standard deviation.

4. Empirical strategy

The aim of this paper is to investigate the effect of managerial capital on productivity among household firms. More importantly, it is to test the heterogeneity of this effect by firm size to determine whether the concept does matter among the smallest firms. The overall strategy is thus to evaluate the effect of MC on productivity, and then to test for heterogeneity.

If managerial capital does have an influence on productivity, it should allow firms to reach a similar output level with fewer inputs – or conversely to increase output while inputs are kept constant. In order to evaluate this link and to further test its relevance for the population of micro firms, this paper relies on a two-stage estimation procedure. This approach amounts to I investigating the influence of MC on Total Factor Productivity (TFP). The first stage consists in estimating unbiased firm-level productivity. The second stage consists in regressing the MC index on these estimated productivity levels, together with firm size indicators. Doing so, I obtain the effect of MC on productivity net of firm size. The heterogeneity of its effect by size is further tested by interaction terms. Comparing the importance of MC by firm size then amounts to testing for heterogeneous effects in this regard. The parameter of interest is thus not only the effect of MC in itself, but also its variation with firm size.

An alternative would be to estimate the direct influence of managerial capital in a production function. But this would assume substitutability between MC and other inputs, which may be true to a certain extent if efficiency gains are involved, but does not hold for low levels of capital and labour. In a micro-firm with two workers, assuming that a higher MC can compensate for one of them is probably too strong. The preferred approach is to assume that the influence of MC is indirect, and goes through its interaction with other inputs.

Another limit of estimating direct production functions is the difficulty to argue in favour of a causal influence. Even when using panel estimators, MC does not vary exogenously. Firms with higher managerial capital may have higher levels of productivity for reasons that are not observed, besides the effect of the former on the latter. The two-stage procedure, by contrast, lets estimating unbiased TFP levels. Regressing MC on the firm-level productivity then requires the lesser assumption that the bias plaguing the estimation of the effect of MC does not vary by firm size. This indirect approach relies heavily on the first-step estimations of productivity, which has to overcome a number of endogeneity concerns, and is described hereafter.

Estimating firm-level productivity

The empirical study of the link between MC and firm-level productivity can only be as good as the first-stage estimations of this productivity. The correct identification of the production functions, is among the oldest challenge in the empirical economic literature, and still evolves rapidly. Recent complementary methods allow significant progress towards overcoming the endogeneity challenges. Essentially, true productivity levels remain unobserved -and so are productivity shocks, to which firms can react differently. As long as input levels are chosen in relation with these unobserved determinants, OLS estimations will be biased. Specifying a Cobb-Douglas value added function:

$$VA_{it} = \beta_0 + \beta_1 l_{it} + \beta_2 k_{it} + \omega_{it} + \varepsilon_{it} \quad (1)$$

Where VA_{it} is the value added of firm i at time t . l and k , are respectively the labour and capital inputs. All variables are transformed in natural logarithm. The error term has two components, ω_{it} and ε_{it} , the former being correlated with inputs. The size and direction of the bias of OLS coefficient on capital will depend on the correlation between inputs and productivity shocks, and more crucially of whether this correlation varies with time. If it does not, the inclusion of firm-level fixed-effects will yield consistent coefficients. Provided firms' exit is also determined by this unobserved but unvarying productivity, fixed effects (FE) will also solve potential selection bias due to endogenous exits. The unvarying nature of the unobserved productivity could however be a rather strong hypothesis, especially when using long-term panels. Other approaches allow for inputs to be endogenous with respect to a time varying unobservable. Three contributions largely frame the empirical literature in this regard: Olley & Pakes (1996), Levinsohn & Petrin⁴⁴ (2003), and Akerberg, Caves & Frazer (2015) (henceforth OP, LP, and ACF respectively). The former two rely on the relationship between some intermediate input entering the production function and the unobserved productivity:

$$m_{it} = f_t(k_{it}, \omega_{it}) \quad (2)$$

This function can be inverted, assuming in particular a monotonic increase in ω_{it} so that the productivity is a function of two observed inputs:

$$\omega_{it} = g_t(k_{it}, m_{it}) \quad (3)$$

⁴⁴ The LP method is usually revenue-based, but fits value added models as well.

Ollin and Park build on the idea that firms change investment (conditional on capital stock) in response to productivity shocks, and provide a non-parametric representation of this inverse function to estimate production functions in two stages. Investment might however not react strongly to productivity shocks –or at least, not monotonically- and the adjustments could take place at other levels. Levinsohn & Petrin suggest using instead a more varying intermediate input demand function such as material expenditure or energy costs. Akerberg, Caves & Frazer (2015) highlight a functional dependence problem of both OP and LP specifications, whereby labour can be a deterministic function of the variables on which the first stage is conditioned. They propose an alternative (“*though quite related*”) estimation strategy, where inverted input demand functions are conditional on the choice of labour input. Wooldridge (2009) additionally proposes a stacked version of LP’s moments, estimated by GMM with efficiency gains, again based on unconditional input demands.⁴⁵ Besides being more efficient than the two-step estimators, this procedure can moreover correct for serial correlation (Van Beveren, 2010).

All these estimation techniques rely on structural assumptions that, despite progressively gaining in generality, still largely condition their validity or failure. In practice, the specificities of the firms’ population and of the available information therefore weights equally -or more- than the overall performance of each technique in choosing the empirical approach. In the relatively specific case of Vietnamese manufacturing SMEs, I use a combination of FE, LP and Wooldridge’s (2009) estimations of production function in addition to the benchmark OLS regressions.

OLS estimation of the firm-level value added function hence follows equation (1), including a time trend. Assuming that the unobserved productivity is mostly fixed in time, I estimate the same equation with firm-level fixed effects:

$$VA_{it} = \beta_0 + \beta_l l_{it} + \beta_k k_{it} + \omega_i + \varepsilon_{it} \quad (4)$$

From both regressions, we can predict the productivity levels by taking:

$$\hat{\omega} = (\varepsilon_{it} - \hat{\beta}_l l_{it} - \hat{\beta}_k k_{it}) \quad (5)$$

Further controlling for the simultaneity of inputs using LP, OP or ACF requires additional hypothesis on the evolution of productivity and on the timing of firms’ choices. As investment

⁴⁵ Comprehensive reviews of production function estimation techniques include Eberhardt and Helmets (2010), or Van Beveren (2010).

only concerns 45.5% of firms across years, down to 33.7% among firms with 1 or 2 workers, it cannot be used as proxy without introducing selection bias. Among the available non-parametric corrections, the LP procedure thus makes more sense, and electricity costs are used as intermediate input proxy in the core of the paper. Productivity is then typically assumed to follow a first-order Markov process: $\omega_{it} = E(\omega_{it}|\omega_{it-1}) + \xi_{it}$ where ξ_{it} is uncorrelated with k_{it} but can depend from l_{it} . The LP procedure then assumes that given k_{it} the firm will decide on l_{it} , and then determine m_{it} accordingly. The rearrangement of eq.1 is thus:

$$VA_{it} = \beta_l l_{it} + \varphi_{it}(k_{it}, m_{it}) + \varepsilon_{it} \quad (6)$$

Where:

$$\varphi_{it}(k_{it}, m_{it}) = \beta_0 + \beta_k k_{it} + g_t(k_{it}, m_{it}) \quad (7)$$

and

$$E(\varepsilon_{it} | l_{it}, k_{it}, m_{it}) = 0 \quad (8)$$

The ACF critique essentially states that l_t and m_t are instead chosen simultaneously, which plagues the identification of β_l in the first stage. Following Wooldgridge (2009), the last and preferred specification of productivity estimation in this paper consists in estimating β_k and β_l directly by GMM. Assuming:

$$E(\omega_{it} | l_{it}, k_{it}, m_{it}, l_{it-1}, k_{it-1}, m_{it-1}, \dots, l_{i1}, k_{i1}, m_{i1}) = 0 \quad (9)$$

and restricting the dynamics of productivity shocks:

$$E(\omega_{it} | k_{it}, l_{it-1}, k_{it-1}, m_{it-1}, \dots) = E(\omega_{it} | \omega_{it-1}) = j(\omega_{it-1}) = j(g(l_{it-1}, k_{it-1})) \quad (10)$$

We can write $\omega_{it} = j(\omega_{it-1}) + a_{it}$ with $E(a_{it} | k_{it}, l_{it-1}, k_{it-1}, m_{it-1}, \dots) = 0$. In other words, inputs l_{it} and m_{it} are correlated with productivity innovations a_{it} ; whereas k_{it} , which is set at the previous period, is not. Neither are all past values of l_{it} , k_{it} and m_{it} . They provide a set of instruments to identify β_l and β_k .

I estimate the four models (OLS, FE, LP, and Wooldridge) of value added function from the unbalanced panel of firms.⁴⁶ I use the log of deflated value added as outcome, and the log of total employment at year n , and the log of real capital value at the end of the previous year as inputs. LP model further includes the log of real electricity expenditures from the last period as proxy. Wooldridge's estimations of productivity rely on lagged values of l_i and exponential functions of log inputs and intermediate input. Concerns about the input prices bias, the endogenous exit of firms and industry-specific effects may remain. Indeed, if firms face different input demand functions (and/or operate at different points of the curves), the correction introduced by the proxy intermediate input variable will further bias the results. Electricity costs are however arguably similar across firms, and should not introduce further differences. Material expenditures are used as robustness checks to estimate alternative productivity measures. Second, to the extent less productive firms are more likely to exit the sample, it is still possible that the productivity estimations will suffer from endogenous exit. The only method that directly corrects for this is the OP estimation, and in practice, the corrections for firms exit are very small.⁴⁷ Lastly, a common practice (challenged, among others, by Bernard, Redding and Schott; 2009) consists in estimating separated production function by industry. Given the high concentration of our sample firms within a few sectors (cf. table 1), industry-specific estimates would require grouping arbitrarily sectors where few observations exist, and would result in introducing additional noise rather than separating heterogeneous manufacturing firms. The productivity is thus estimated on the full sample of firms.

Table 4 presents the coefficient estimates of firm-level production function on the whole population of firms, using the unbalanced panel. Column 1 correspond to OLS estimation of eq.1 with an additional time trend, column 2 further introduced fixed effects to estimate equation (1); column 3 applies the LP procedure with electricity costs as intermediate input, and column 4 implements Wooldridge's GMM estimation. Past values of inputs are limited to one lag in order to prevent losing years of observations. Past values for 2007 were obtained using the 2005 dataset. LP and Wooldrige results use fewer observations due to missing information on intermediate input variables. Looking at excluded firms did not reveal any specific pattern. In particular, excluded firms were not concentrated among the smallest microenterprises for which one could fear that no electricity at all is used.

⁴⁶ On implementing PF estimators in Stata, see Yasar, Raciborski & Poi (2008), Petrin, Poi & Levinsohn (2004).

⁴⁷ Such is the case for Newman *et al.* (2015) using Vietnamese data on larger firms.

Table 4. Production function estimations

	OLS	FE	LP	W
Log(capital)	0.242*** (0.009)	0.133*** (0.011)	0.148*** (0.012)	0.149*** (0.0106)
Log(#workers)	0.936*** (0.018)	0.711*** (0.025)	0.841*** (0.017)	0.913*** (0.0272)
time	0.064*** (0.008)			
Constant	1.025*** (0.050)	2.272*** (0.086)		-0.738 (0.975)
Observations	5,699	5,699	4,925	4,825
P(constant returns to scale)	0.00	0.00	0.5518	0.01

*** p<0.01, ** p<0.05, * p<0.1
 Clustered s.e. by firms in models 1,2,4, bootstrapped with 250 replications for LP estimates

Compared to the benchmark –and expectedly biased- OLS estimations, all corrections consistently reduce the estimated returns to capital, which is consistent with the simultaneity bias (more productive firms choosing more capital). The reduction in the labour coefficient is less marked; heterogeneity in productivity levels could arguably allow employing more workers altogether, or producing the same output with less workers. Fixed effects estimations overcorrect the bias for both inputs, and find lower returns (and overall decreasing returns to scale). However, the magnitude of firms’ productivity shock does not vary much with time in this particular population of firms: overall, FE estimates are comparable with other corrected returns. Both models correcting for fixed and varying simultaneity find returns to capital of nearly 15 per cent at the mean, and the preferred Wooldridge specification yields high average returns to labour, close to the OLS estimates. One explanation could lie in the proportion of micro-firms in the sample for which more productive firms are those who can employ an additional worker. A useful benchmark of productivity estimation on Vietnamese firms is found in Newman *et al.* (2015), who use a sample of much larger firms and find returns of comparable range, varying by industry. The differences in coefficients between estimation methods are comparable in sign and size.

5. Results: managerial capital and productivity among micro-firms

The primary objective of this paper is to investigate the link between managerial capital and productivity, and to test whether this link depends on firm size. Even if the firm-level productivity levels are efficiently estimated, OLS regressions of MC on productivity are likely to be biased by the exclusion of other factors entering total factor productivity. A key aspect is the extensible boundaries of the concept of managerial capital. As MC essentially aims at measuring owners' abilities, it will be difficult to include a sufficient number of dimensions to arguably capture all of it. Even when using the twelve variables available in the SME survey, it would be difficult to argue in the sense of a perfect measure of MC. The strategy used in this paper is to get as close to causal inference as possible using the whole population of firms, using panel estimators to regress MC on productivity, and then to test whether the association is similar across firm size. The assumption is that even though some varying heterogeneity could still plague the estimation of the MC-productivity link, these potential biases can be constant by firm size, and comparing the significance and size of the effects is hence feasible.

In order to control for all fixed determinants of both MC and productivity, whether observed or not, all estimates use firm-level fixed effects. The outcome variable is the total factor productivity estimated in section III.1. Specifically, I use the standardised productivity estimates of the preferred specification (Wooldridge, 2009) in this section, and alternative productivity estimates as robustness tests. The baseline specification is thus:

$$\Omega_{it} = \beta_0 + \beta_1 MC_{it} + \beta_2 S_{it} + \gamma C + \mu_i + \varepsilon_{it} \quad (11)$$

Where Ω_{it} represents firm-level productivity estimated by Wooldridge's (2009) GMM, MC_{it} is the managerial capital score of firm i at time t , S_{it} is the firm size category, and C a vector of controls for trends. Firms fixed effects are denoted μ_i . This set C of control variables aims at removing potentially differentiated evolutions by years, sectors, or regions (and finally with time*regions interactions). As neither the productivity levels nor the MC scores can be directly interpreted in levels, all results are provided as standardised variations. The results of this baseline estimation are provided in the first column of table 5. I find that a standard deviation in MC score results in a 6 per cent increase in productivity on average among the MSME sample, significant at 1 per cent. This average effect is net of the influence of firm size.

A further concern regarding bias arises from the limited indicators of managerial capital available in the data. As other practices and traits that could be used as additional proxies are not available in our data, part of the manager's ability remains unobserved by our MC score. I introduce a set of controls to proxy individual ability, which shows some variation across year (firm owner does change in some cases). Gender, education (higher secondary or more), and age class are controlled for in the following model (included in the X vector). An additional set of time-varying firm characteristics is included: informality (being registered or not), type of premises, and access to infrastructures (road, in this case). All can vary during the time period considered, and may influence productivity.

$$\Omega_{it} = \beta_0 + \beta_1 MC_{it} + \beta_2 S_{it} + \gamma C + \delta X + \mu_i + \varepsilon_{it} \quad (12)$$

Results of equation 12 are provided in column 2; additional controls have little influence on the MC coefficient, which tends to indicate that fixed effects estimates removed most of the existing bias. Looking at the description of MC score by size, we know that larger firms have both better business practices, and more entrepreneurial attitudes. We also know from the results of section III that productivity levels are strongly and constantly increasing with firm size. The results provided in table 5 are net of this firm size effect, but the coefficient of MC score can nevertheless have different slopes depending on the size category if its influence on microenterprises is lower than in medium ones. A third model includes interactions between MC index and size categories:

$$\Omega_{it} = \beta_0 + \beta_1 MC_{it} + \beta_2 S_{it} + \gamma C + \delta X + \theta(MC_{it} * S_{it}) + \mu_i + \varepsilon_{it} \quad (13)$$

The vector θ of estimated coefficients by size is then used to test for a differentiated effect of MC depending on the category. Below table 5, I report Wald test for joint significance of the interaction term.

Table 5. Managerial capital and productivity

	(1)	(2)	(3)
Standardized values of (MC)	0.059*** (0.009)	0.058*** (0.009)	0.093*** (0.018)
Size]2,5]	0.559*** (0.019)	0.576*** (0.018)	0.547*** (0.022)
Size]5,10]	1.080*** (0.025)	1.113*** (0.025)	1.091*** (0.028)
Size 11+	1.725*** (0.039)	1.759*** (0.039)	1.731*** (0.050)
(Size_cat=]2,5])*MC			-0.040** (0.019)
(Size_cat=]5,10])*MC			-0.051** (0.025)
(Size_cat=11+)*MC			-0.042 (0.038)
Controls (ability)	No	Yes	Yes
Time dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Time*region interaction	Yes	Yes	Yes
Constant	-0.661*** (0.015)	-0.918*** (0.105)	-0.893*** (0.104)
Observations	4,840	4,840	4,840
R-squared	0.561	0.603	0.604
Number of id	1,850	1,850	1,850
Testparm interactions: F(3, 1850) = 1.79 Prob > F = 0.1467			

As much as managerial capital and productivity depend on firm size, the effect of the former on the latter is as important among micro firms as among medium ones. Marginal effects depending on the size category and significance levels are reported in appendix 2. They confirm this finding. The indicators of managerial capital, although more scarcely found among micro firms, discriminate equally or more in this population between productive firms and subsistence businesses. The effect of business practices and entrepreneurial orientation on productivity is thus as large as among larger enterprises. In other words, these results show that when every other factor (except some possibly remaining time varying heterogeneity) is controlled for, including levels of inputs, firms with a higher MC generate more output. More importantly, they show that the difference induced by a higher managerial capital is as large in micro-firms as in small and medium ones.

6. Robustness

This section provides further robustness tests. Section A uses alternative measures of productivity, and reproduces both steps of the two-stage procedure. The results are very consistent across estimation methods. Section B applies the results of the alternative, direct estimation where MC directly enters the production function. Although this is not the preferred specification, the results are highly consistent. Finally, section C provides the results of a comparable approach on a different dataset. Even while the SME panel includes a large number of informal microenterprises, it is biased towards larger firms. An alternative dataset is thus employed, which has the advantage of being representative of the Household Businesses population (in the two cities where it was conducted: Hanoi and Ho Chi Minh city). The drawback is that a much smaller number of variables are included in the MC index, and that the data does not let estimating production functions as the capital measure is inconsistent.

i. Alternative productivity estimation

Most of the previous analysis relies on the firm-level productivity estimated in the first stage. A remaining bias in these estimates would cast doubt on the results of the second stage, in particular if the bias is somehow also correlated with managerial capital. The results were re-obtained using an alternative estimation of productivity, based on a different correction for simultaneity using material expenditures. The results of the production function estimations are provided in table 6, using the same specifications than section 4.

Table 6. Production functions estimates using log material expenditures

	OLS	FE	LP	W
Log(capital)	0.242*** (0.009)	0.133*** (0.011)	0.158*** (0.012)	0.171*** (0.0105)
Log(#workers)	0.936*** (0.018)	0.711*** (0.025)	0.835*** (0.016)	0.872*** (0.0256)
time	0.064*** (0.008)			
Constant	1.745*** (0.055)	2.997*** (0.078)		1.303*** (0.416)
Observations	5,686	5,686	4,885	4,875

Returns to capital and labour go through overall comparable corrections when using this alternative proxy of material expenditures, although the coefficients of capital of LP and Wooldridge estimators are higher (and the returns to labour are lower). The firm-level

productivity is then used as outcome variable and the results of similar regressions than those of section IV are provided in table 7. The effect of MC is consistent and still yields a 4% increase in productivity per standard deviation. The heterogeneity of the coefficient by firm size is, again, impossible to back up. Joint significance test of the interaction terms (reported below table 8) do not let concluding to their significant influence. Managerial capital does matter among small firms, at least as much as it does for medium-size ones. Finally, productivity estimates using other corrections than the preferred Wooldridge specification (fixed effects and LP) were used with similar results.

Table 7. Managerial capital score and alternative productivity measure.

	(1)	(2)	(3)
Standardized values of (MC)	0.069*** (0.010)	0.067*** (0.010)	0.097*** (0.020)
Size [2,5]	0.514*** (0.020)	0.539*** (0.019)	0.514*** (0.023)
Size [5,10]	1.006*** (0.028)	1.049*** (0.027)	1.035*** (0.032)
Size 11+	1.622*** (0.041)	1.660*** (0.041)	1.642*** (0.051)
(Size_cat=2)*MC			-0.031 (0.019)
(Size_cat=3)*MC			-0.051* (0.028)
(Size_cat=4)*MC			-0.042 (0.039)
Controls	No	Yes	Yes
Time dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Time*region interaction	Yes	Yes	Yes
Constant	-0.615*** (0.017)	-0.926*** (0.124)	-0.903*** (0.123)
Observations	4,889	4,889	4,889
R-squared	0.483	0.559	0.559
Number of id	1,852	1,852	1,852
Testparm interactions: F(3, 1849) = 0.78 Prob > F = 0.5061			

ii. Direct estimation

Notwithstanding substitutability considerations, it can be of interest to compare the results of direct estimations where MC enters the production function as an additional input. In line with the previous approach, the actual question of interest would then be the significance of its interaction term with inputs. Joint significance would imply that its effect is heterogeneous by input levels. Taking the empirical counterpart of a Cobb-Douglas production function, we can write:

$$\begin{aligned} VA_{it} = & \beta_0 + \beta_1 MC_{it} + \beta_2 K_{it} + \beta_3 (MC_{it} * K_{it}) + \beta_4 L_{it} \\ & + \beta_5 (MC_{it} * L_{it}) + \gamma C + \delta X + \mu_i + \varepsilon_{it} \end{aligned}$$

Using the same notations as above, and similarly taking natural logarithms of value added and inputs. MC index and outputs are again expressed in standardised values. The direct influence of managerial capital on output is β_1 . Its effects might vary with firm size at different levels of capital and labour, in which case β_3 or β_4 will be significant. This would imply that the direct influence of MC on output is not linear along levels of capital and/or number of workers. Table 8 provides the results of various declinations of equation 14. The first column uses no interaction terms, and no controls. The second column introduces time-varying controls, with little impact. Variations in managerial capital explain, on average, 9 to 11.5 standard deviation in output. Interaction terms are, again, jointly insignificant.

Table 8. Direct effect of Managerial capital and heterogeneity by input levels

	(1)	(2)	(3)
MC	0.090*** (0.012)	0.092*** (0.012)	0.115** (0.057)
log(# workers)	0.674*** (0.026)	0.681*** (0.028)	0.696*** (0.030)
log(capital)	0.135*** (0.011)	0.104*** (0.011)	0.102*** (0.011)
MC * (Size]2,5])			0.081** (0.041)
MC * (Size]5,10])			0.055 (0.045)
MC * (Size 11+)			0.072 (0.048)
MC* log(capital)			-0.012 (0.009)
Controls	No	Yes	Yes
Time dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Time*region interaction	Yes	Yes	Yes
Constant	3.042*** (0.076)	3.328*** (0.168)	3.312*** (0.169)
Observations	5,699	5,699	5,699
R-squared	0.283	0.342	0.344
Number of id	1,889	1,889	1,889

Testparm interactions: $F(3, 1849) = 1.42$

Prob > F = 0.2337

iii. Alternative sample: the Household Business and Informal Sector survey

Finally, one could be concerned by the fact that the data is biased towards larger firms. The inclusion of informal micro enterprises is non-random, and the sample is overall not representative. I conducted a similar analysis on an alternative panel dataset, the Household Business and Informal Sector Survey (HB&ISS). These data are representative of the Vietnamese informal sector, with an average firm size of 1.8 workers (including the owner). They were collected in 2007 and 2009 in Hanoi and Ho Chi Minh City. They contain closely related indicators of managerial capital, indicating: (1) if the firm adopted a strategy, (2) if the owner prospects actively customers (by advertising or “trying to make him/herself known” among neighbours), (3) if he/she is able to react to shocks (4) if he/she sets prices by bargaining or related to production costs (compared with being price-taker), and (5) if he/she keeps no accounts, simple records, or formal books (which answers some concerns about the bookkeeping variable used in the previous analysis). Table 9 presents the incidence of these alternative indicators in the HB&ISS data, and the MC index constructed with a similar methodology. A comparable proportion of micro firms use formal accounts (3.3 per cent) –but 40 per cent use personal notes rather than no accounts at all. The other indicators of MC are defined more loosely than above, allowing for instance “bargain with customers” to be considered “active pricing”, or defining “prospecting customers” as those doing anything but “waiting for them to show up”. This explains their higher incidence in the population. The relative values of the MC score, measuring distances between levels of managerial capital, yet bear the same meaning.

Table 9. MC index components in the HB&ISS sample

	Mean	Standard deviation	min	max
MC index	0.000	1.000	-1.366	2.914
Has a strategy	0.242	0.428	0	1
Prospect customers	0.418	0.493	0	1
Shock reaction	0.285	0.452	0	1
Active pricing	0.755	0.43	0	1
Accounts :				
<i>No accounts</i>	0.571	0.495	0	1
<i>Personal notes</i>	0.396	0.489	0	1
<i>Formal accounts</i>	0.033	0.18	0	1

The panel being limited to two years of survey, together with inconsistencies in the measure of capital, do not let estimating similar production functions. Instead, I estimate direct production functions models with firm-level fixed effects, using the log of net profits as outcome variable,

and controlling for a large number of varying characteristics. Results using the balanced panel of 2,008 household businesses are provided in appendix table 3. The set of controls progressively included in columns 1 and 2 includes informality, size, type of premises, and access to basic equipment such as water or electricity. Among these household businesses, representative of the Vietnamese urban informal sector, the MC score also has a positive and statistically significant association with performance. This association ranges from 8 to 9 per cent.

7. Conclusion and discussion

This paper provides a straightforward answer to an open question of growing importance. It uses a rich panel data consisting of 5,878 observations of 1,892 unique firms surveyed between 2007 and 2013, in which a set of indicators of managerial capital is available -and consistent across years. One original feature is that these indicators allow combining standard indicators of business practices and less frequent indicators of the firm's entrepreneurial orientation into a single score of MC. The results of consistent firm-level productivity estimates are regressed on this score. A variation of one standard deviation in the MC score is associated with a 9 to 11 per cent significant increase in productivity. The interaction terms with firm size category are not significant, as confirmed by further marginal results. Again, no causal statement is made on the relation between our measure of MC and productivity. Even though a large number of biases are technically controlled for, variations in managerial capital remain unexplained. Rather, the statement is that managerial capital does matter among micro and small firms, at least as much as it matters among medium ones.

The implications of these results are, by contrast, not straightforward. Using observational data allows using a more complex measure of MC, including elements that one cannot exogenously change with a training program. On the other hand, it does not provide directly usable keys to enhance micro-firm productivity. A key preliminary question would be to determine if managerial capital, and in particular its entrepreneurial orientation component, is teachable at all. If the observed variations find no explanation, one would be left with the frustrating justification of unobserved individual talent (as Balzac attributes to *monsieur Graslin*, whose education level takes no part in explaining entrepreneurial talent). A rough indication is given in table 10, which regresses MC score on the set of available individual characteristics with OLS to provide some insights on its variation.

Less than 20 per cent of the variance of the MC score is explained by the (limited number of) individual characteristics. Yet, besides males and younger individuals having higher MC scores, education has by far the largest influence. The little variance explained can be interpreted as a proof of the relevance of the MC index – which indicates more than differences in education.

Table 10. Explaining managerial capital

Male	0.222*** (0.034)
Finished lower secondary	0.102** (0.042)
Finished upper secondary	0.424*** (0.044)
Age 30-45	0.011 (0.038)
Age 46-60	-0.017 (0.046)
Age >60	-0.127* (0.072)
HH size 3-5	-0.281*** (0.073)
HH size>6	-0.362*** (0.084)
Constant	0.149 (0.104)
Observations	5,878
R-squared	0.197
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

A useful comparison to challenge the validity of these results is the paper of McKenzie and Woodruff (2015), which evaluates the link between business practices and small firms survival and profits. Besides using multiple countries, one advantage of their paper is to include a larger set of business practices. On the other hand, they do not estimate unbiased firm-level productivity, and they focus only on business practices, including no indication of entrepreneurial orientation or attitudes. Their message is overall comparable: managerial capital also matters for small firms in developing countries. Furthermore, the variation in MC score is strictly comparable among their size groups, as when larger firms (20 workers or more) have a one-standard deviation higher score. The main difference lies in the size of the effects. McKenzie and Woodruff's (2015) effect of MC on profits are large (22 per cent at the mean for a one sd. in MC), which, they argue, echoes the findings of Bloom and Van Reenen (2007). The effect found in this paper, although significant, is half of that (9 to 11 per cent). A seducing explanation lies in the sharper productivity measures used in the present paper. The magnitude of the effects found is easier to reconcile with the mixed results found in training programs evaluation, many of which lack power to detect small effects. It is nevertheless likely that the explanation lies in the different countries included (Vietnam is not part of their study), and in the additional indicators included in the MC index. Their paper uses a more detailed set of variables related to market research

capacity, stock control, and financial planning. This additional information probably captures, at least partly, more variation in the practices that influence small business productivity.

Determining which skill or trait should be promoted is undoubtedly important from a policy perspective, and the accumulation of training programs in heterogeneous contexts should, at one point, come up with consensual findings. The approach of this paper is more general in the sense that it rather evidences that managerial capital is a relevant prism to look at the efficiency of micro and small firms in developing countries.

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Appendix

Appendix table 1. MCA results: contribution to the first dimension and adjusted inertia

Variable	Value	Dim.1 coordinates	Variable	Value	Dim.1 coordinates
Accounts	0	0.236	Pricing	Cost perc.	-0.031
	1	-2.363		=Competitors	0.163
Advertise	0	0.077	Hiring method	<Competitors	-0.28
	1	-2.644		Bargain	0.061
Wage policy	None	2.677	None	Government	-0.614
	Local comp.	-1.397		Newspaper	2.567
	Local SOE	-1.812		Labour exc~e	-1.746
	Authorities	-1.401		Friends	-1.845
	Agric rates	-1.242		Authorities	-1.43
	Negotiations	-1.333		Personnal rel.	-1.262
	Paying cap~y	-1.303		Service centre	-1.207
	Other	-0.679		Other	-1.727
Suppliers location	All commune	1.962	Products improvements	0	-1.832
	Province	-0.165		1	0.683
	Country	-1.475		0	-1.507
Suppliers type	Foreign	-8.426	Innovation: products	0	0.053
	Private ent.	0.25		1	-2.205
	Only	0.177	Innovation: process	0	0.185
	Some HH.	-1.096		1	-2.433
Outside services	0	0.082	Innovation planning	0	0.56
	1	-2.378		1	-1.582
<i>Note: contributions based on MCA for all years. Negative values contribute positively to the MC index.</i>					
		2007	2009	2011	2013
<i>Dimension</i>					
	dim 1	60.38	59.19	53.45	45.3
	dim 2	65.77	66.49	59.05	55.34
	dim 3	70	69.63	62.9	59.98
	dim 4	72.04	71.33	64.84	62.82
Method: Burt/adjusted inertias					

Appendix table 2. Marginal effects of MC on productivity by size category

Delta-method						
	dy/dx	Std. Err.	z	P>z	[95% Conf.	Interval]
1,2	0.093	0.018	5.060	0.000	0.057	0.129
]2,5]	0.053	0.010	5.110	0.000	0.032	0.073
]5,10]	0.041	0.018	2.280	0.023	0.006	0.077
11+	0.051	0.033	1.540	0.123	-0.014	0.116

Appendix table 3. MC and performance in the HB&ISS sample

	Log net profits		
	(1)	(2)	(3)
MC index	0.0891*** (0.0327)	0.0785** (0.0323)	
Time	0.334*** (0.0407)	0.300*** (0.0456)	
Interactions:			
Gender			0.00467 (0.0693)
Youth			-0.0527 (0.0683)
Informal (no BRC)	-0.0895 (0.0999)	-0.0398 (0.0930)	
Size (# workers)	0.254** (0.109)	0.229** (0.103)	
Invested in the past year	-0.0473 (0.0817)	-0.0545 (0.0816)	
Premise: at home		-0.0739 (0.125)	
Premise: dedicated		-0.0182 (0.133)	
Access to water		0.0244 (0.0831)	
Access to phone		0.112 (0.106)	
Access to mobile phone		0.132* (0.0713)	
Access to internet		0.389 (0.240)	
Constant	9.838*** (0.160)	9.756*** (0.230)	
Observations	4,016	4,016	
R-squared	0.040	0.046	
Number of id	2,008	2,008	

Conclusion

“Sometimes, people suggest that I should switch to doing this or that, but I do not dare. Because I don’t have the capital, and if I get sick and just lie there, how am I going to do?”

A street vendor, Ho Chi Minh City, 2013.

Micro and small businesses are the main livelihood of millions of individuals around the developing world. In Vietnam, the Household Business sector does not exhibit signs of decline despite rapid economic growth. There are, on the contrary, indications of this set of businesses being more dynamic than in other Low or Middle Income Countries. This doctoral thesis attempts to throw a light on some of the main factors that could enable them being even more so. The four chapters adopt indeed these *non-farm unincorporated household businesses* as observation unit, and offer insights into possible ways to improve their condition. The common denominator of these chapters is that they question the extent to which policies can improve workers’ lives, and in turn households’ livelihoods. By contrast with a widespread view assuming that formal employment will eventually offer sufficient opportunities to all workers, this approach assumes that workers in household businesses cannot switch so easily, and argues that there exist several ways to improve the current environment in which they operate.

For these micro and small enterprises do operate in precarious conditions. They are overwhelmingly informal: most of them are not registered to the authorities regulating business activities and/or with tax administrations. They consequently have no legal existence as production units (even though the object of their activity is not itself forbidden), and this comes with a number of constraints, and greater uncertainty. The workers who operate these businesses are rarely part of any social protection scheme. Without access to formal risk-pooling mechanism, despite facing high risks on their workplace (which are often outside, or with little adapted equipment), they have no compensation in the frequent cases of illness or injury. These activities remain, in their vast majority, at a low level of organisation. Their owner often considers the activity as temporary, and manages it on a daily basis. Many keep no book, have almost no stocks, and they buy and sell within a network of close suppliers and clients.

What benefits may arise from policies that would aim at giving these businesses a legal existence, protecting them against health risks, or enhancing their management skills? To address these questions from the perspective of the businesses themselves, I mainly rely on observational data, and complementarily on qualitative fieldwork. Inferring causal relationships from non-experimental data may seem to some, at this point, somehow old-fashioned. But while it requires a much greater effort in convincing that endogeneity concerns are properly handled, it may have the advantage to enable investigating at a larger scale than what controlled trials would allow.⁴⁸ Some of these data are first-hand, such as the Household Business and Informal Sector Surveys (HB&ISS). I was involved in the initial project that led to the first two surveys in Vietnam in 2007 and 2009. I also participated to its up scaling in 2014. When the nationally representative HB&ISS was implemented, I took part to the questionnaire design, and the sampling and post-weighting processes. I also use second-hand survey data. The second and third chapters, which aim at linking information on health with enterprise-level data, rely on original panel data constructed from two rounds of Household Living Standard Surveys (VHLSS), conducted by the General Statistics Office. The last chapter uses a long-term Small and Medium Enterprises panel survey (SME), conducted by the University of Copenhagen, and the Central Institute for Economic Management (CIEM). The results from the four chapters are summarised hereafter.

1. Findings

A. Do Informal Businesses Gain From Registration, and How?

“Now I need money, I lost all my investment when the police confiscated my things.”

The same woman.

In this paper, co-authored with Mireille Razafindrakoto and François Roubaud, we addressed two policy-relevant questions on informality: from the perspective of existing informal household businesses (IHB), is there any gain in joining the “formal” household business (FHB) sector? If yes, how much? Through which channels do they occur? We use the business registration certificate as the main criteria of informality (others are used for robustness checks), and rely on

⁴⁸ Not to mention their cost, and the obvious ethical problem that would arise from randomly allocating health shocks.

the HB&ISS panel data (2007 and 2009 rounds) to compare businesses that joined the formal sector with those that remained informal.

We show that the IHBs that registered are a specific population, characteristics of which were already close to the ones of formal HBs. This is a first indication that not all businesses have a vocation to register, together with a manifestation of a selection bias. Using matched difference-in-difference specifications, we then show that formalized HBs benefit from improved conditions of operation. Registration facilitates accessing new equipment (electricity and internet), and enables them to operate on a larger scale: their average size (in number of workers) increases, they have better access to indoor premises, and keep more often written accounts. We also find formalization to be associated with a more competitive environment. Finally, these improved conditions are showed to improve the formalized businesses' performances: annual value added increases by one fifth.

An equally important finding is the heterogeneity of the effect by initial size. Own-account workers (businesses made of a single worker) who registered did not see any significant improvement.

B. Health shocks and permanent income loss: the household business channel

“The last time I was sick I was off for two months. Then the person who stores the cart for me was worried that I was dead.”

The same woman.

The results of this study enlighten an underestimated –yet powerful– mechanism that adds up to the general vulnerability of household businesses. I provide strong evidence that microenterprises are vulnerable to health shocks affecting their operators and/or other members of the same household. In both cases, health shocks translate into time absent from work (recovering, or taking care of other family members), and into increased health expenditure (to which the whole household budget contributes). As household businesses rely on a few workers' labour input, often from the same household, and as their budget is often mingled into the general budget of the household, both of these mechanisms affect indirectly the businesses' operations.

I show that although intra-household labour reallocation mitigates the direct labour supply decrease, large out-of-pocket health expenditures have the potential of crowding out business-related expenditures. The expenses that households have to meet in such cases are out of

proportion with the income that the HB can generate. I also show that not only the income in the current period is affected, but also the growth potential of the HB, as investment is significantly decreased.

C. Can Insurance Mitigate Household Businesses' Vulnerability to Health Shocks?

“Having health insurance is useless. I just leave it there. [...] I may as well just go to the pharmacy and buy the damn medicine.”

The same woman.

Knowing that HBs are vulnerable to health shocks affecting individuals, the protection of these individuals should in turn mitigate the businesses' vulnerability. Comparing household businesses that differ only by the proportion of individuals insured in the household to which they belong, there should be a positive association between insurance and HB outcomes. If individuals are fully protected, health shocks will have no impact on health expenditure; the HB income should then be higher (and the health expenditures lower on average). The identification problem is that insurance status depends on both the household income, and the health status of individuals (healthy individuals generally buy insurance less often).

This paper exploits an exogenous variation in health insurance following a 2005 reform, whereby all children under 6 were given free health insurance. This discontinuity lets comparing perfectly similar HBs, which differ only by the proportion of individuals (in this case, children) having health insurance in the household to which they belong. I show that insurance does not mitigate the vulnerability of household businesses to health problems. It has no impact on the amount of out-of-pocket health expenditure. If insurance implies more frequent health care utilisation, it should also improve health and let the businesses operate more days, but neither is this true. There is, in turn, no association with HB income (which should have been the case given the large negative impact of health shocks on HB). The only effect of insurance is found to be a temporary increase in investment, which is interpreted as a *peace of mind* effect. It seems that HB owners misinterpreted the mitigating effects of insurance on expenditure, and perceived the environment to be less risky - for a short period only.

D. Does Managerial Capital also Matter Among Micro and Small Firms?

“I only think about trying to sell (rice) one day at a time. There’s no guarantee that I will make money. I’ll try to make profit one day at a time.”

The same woman.

By contrast with the three previous chapters, this last paper handles a question that is related to the inner workings of household businesses. External constraints weigh on their potential; but can there be internal reasons too? The management skills that are common among larger firms are scarcely found among HBs in Vietnam. But does that really matter? This paper answers this question in a comparative manner, by estimating the influence of managerial capital (a broad concept that encompasses business skills and entrepreneurial attitudes) on productivity, and testing for the heterogeneity of this effect by firm size.

It uses four rounds of the SME panel data, in which a set of indicators of managerial capital is available -and consistent across years. I estimate a score to characterise managerial capital, based on twelve indicators of practices and attitudes, and regress the results of consistent firm-level productivity estimates on this score using panel models. I show in a first step that medium firms are consistently more productive than micro and small ones. The higher prevalence of business skills (using formal accounts, selecting suppliers, costing, innovating,..) among these larger firms is also evident. But the key question addressed is whether the influence of managerial capital on productivity varies with firms’ size. I find that a variation of one standard deviation in the MC score is associated with a 10 per cent significant increase in productivity on average, and more importantly, that this influence is similar for micro, small, and medium firms. The statement is that managerial capital does matter among micro and small firms, at least as much as it matters among medium ones. It is, as such, a relevant lever to enhance micro firms productivity.

2. Implications

Different approaches can be used to estimate the number of household businesses in Vietnam. But whether one relies on Labour Force surveys or on Household Living Standard Surveys, their total number in 2014 is no less than 9 million. How can the four chapters of this thesis inform policy maker facing such a large number of predominantly informal businesses? A simple version of their implications is provided in figure 1.

Figure 1. An unsophisticated summary of implications.



Having showed that formalization improves performance, that health shocks have outsized consequences when inefficiently covered against, and that managerial skills matter, the immediate conclusion would be to recommend promoting large-scale formalization, scaling up health insurance, and multiply business training programs. But more details are needed to go beyond mottos.

Legalise rather than formalize. The results of the first chapter evidence the positive effect of formalization. They should however not be understood as a one-size-fits-all message. Equally important is the fact that it has no effect on own-account workers, and the reasons behind this absence of effects. Indeed, going formal is essentially being no longer illegal. For small businesses having employees, this process is achieved through registration. But for the smallest self-employed businesses, getting a licence is still not associated with more benefits than costs. This is

probably because registration is not enough for this population of businesses to become fully legal. These are the ones operating predominantly outside, in public spaces, from which they are increasingly chased. No licence will grant them improved access to the places in which urban policies prevents them from operating for the sake of modernity. The channels through which formalization enhances firms' efficiency are thus inoperative. Rather than registering at all cost, the relevant approach is to grant recognition to these fundamentally legitimate businesses. This is the only way towards alleviating the precariousness and uncertainty of their environment. There is probably some benefit to large-scale formalization, but there are certainly much more to large-scale legalisation.

Fund health care. In post-socialist States such as Vietnam, the public health care system was well advanced, but severely underfunded. Since the 80s, emphasis was put on out-of-pocket payments in compensation. Together with the development of little regulated private health care, this led to a two-tiered provision of care, and to an increase in the weight of health expenditures in households' budgets. This came alongside shortcomings in health insurance. Social protection schemes that are based on employment-based contributions have structural funding issues in presence of a large informal sector. Willingness to balance the budget led to unbalance the costs and benefits: being insured does not offer financial protection. The results of the second and third chapter reveal an overlooked opportunity cost of the combination between these financing strategies and the limited protection offered by health insurance: households bearing the cost of health care are deprived from operating their business on the right scale. The loss of income *not generated* by these household businesses because their material expenditure was crowded out by health expenditure, and their growth potential lost to sub-optimal investment, represent large indirect economic costs. An unanticipated message of these findings is that there are additional benefits in providing sufficient public funding for health care: it might stimulate household enterprises. This needs to be kept in mind in the difficult trade-off for health care financing. When compensating for the lack of employment-based contributions is necessary, putting the burden on out-of-pocket payment is economically costly.

Insure credibly. Chapter 3 shows that even when insurance does not offer actual financial protection, it does stimulate investment. This has been interpreted against recent work on the topic as a specific effect of the insurance status on the perceived level of uncertainty. It denotes a positive externality of health insurance. Even if progress is made towards legalising household enterprises, a complete formalization cannot be achieved in the medium run, and getting

household businesses to pay social contributions is not a reliable hypothesis. In this frame, protecting household businesses through individual insurance may be an option, but only under certain conditions. Enabling individual to keep generating an income despite shocks should then be the relevant prism through which the effectiveness of the scheme is evaluated. In order to minimise the disruption in the income stream resulting from idiosyncratic shocks, out-of-pocket expenditure should be reduced. The difference between direct billing and differed payment translates for constrained households into the obligation to cut expenditures or not. In addition to increasing public funding of health care, provisions to the insurance schemes is probably the only way to make sure that health insurance provides sufficient benefits to become credible.

Change attitudes in addition to teaching skills. The fourth chapter shows that managerial capital, understood as the combination of business skills and entrepreneurial attitudes, does explain as much variation in productivity among micro and small firms as it does among medium ones. There is, in addition to education and human capital, a specific benefit to enhancing the way household businesses are managed. But while providing business owners with the relevant business skills is achievable through training programs⁴⁹, their effect on final outcomes is still unclear. This could be an indication that attitudes explain a large part of the influence of managerial capital. It is evident in the qualitative surveys that many business owners do not consider their activity as an enterprise. They would not even use the Vietnamese word for “work” when talking about it. A change in attitudes of these workers, which would encourage them to consider their activity as an actual business, could yield the benefits that business-training programs largely failed to evidence. Or it may be that a combination of both aspects (skills and attitudes) is the relevant approach.

Combine all of these: change their environment. All of these aspects are interrelated. Many household businesses do not borrow, register, or consider their activity as an actual enterprise because they fear that health problems will crowd out all of their investments. Illegality in itself also weighs on their prospects: why scale-up, or buy more stocks, if the police could confiscate everything the next day? Lacking managerial skills, is scaling-up even possible? Re-reading interviews transcripts, I realised that the woman quoted above mentioned all aspects that are dealt with throughout the chapters. But how many other workers face these accumulated constraints? By releasing them jointly, additional gains would probably occur. It is the overall uncertainty of their environment that mainly prevents household enterprises to operate at their

⁴⁹ assuming that their effectiveness does not depend from the scale on which they are implemented.

full potential. More questions are raised by this work than resolved, but it is nevertheless able to bring a key message: the dynamism of this sector deserves to be recognised, and there are ways to enhance it.

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List of Acronyms

DIAL	Développement, Institutions, Mondialisation
ECLAC	Economic Commission for Latin America and the Caribbean
ENAHO	Encuesta Nacional de Hogares
ENEMPSI	Enquête Nationale sur l'Emploi et le Secteur Informel
ENSETE	Enquête Nationale sur l'Emploi et le Travail des enfants
GSO	General Statistics Office
IADB	Inter-American Development Bank
ILO	International Labour Office
IRD	Institut de Recherche sur le Développement
HB	Household Business
HBIS	Household Business and Informal Sector
HB&ISS	Household Business and Informal Sector Survey
LFS	Labour Force Survey
ME	Micro-enterprise
MC	Managerial Capital
MSME	Micro, Small, and Medium enterprises
OAW	Own-Account Worker
OOP	Out-of-Pocket
SoE	State Owned Enterprise
SME	Small and Medium enterprises
UN	United Nations
UNDP	United Nations Development Programme
VHLSS	Vietnam Household Living Standard Survey
WB	World Bank

Résumé

Le terme de secteur informel désigne l'ensemble des micro-entreprises domestiques échappant plus ou moins à la régulation publique. Il représente dans les pays en développement une part importante –voire dominante- des emplois. C'est le cas au Vietnam, où son poids reste relativement stable malgré une croissance économique rapide et une forte réduction du taux de pauvreté. La compréhension des dynamiques micro-économiques de ce secteur très hétérogène est primordiale pour informer les politiques publiques. Les quatre chapitres de ce travail posent quatre questions fondamentales de ce point de vue : quels bénéfices peut-on attendre de la formalisation de ces micro-entreprises (chapitre 1)? Dans quelle mesure ces unités de production, dont le budget est souvent confondu avec celui du ménage, sont-elles vulnérables aux chocs de santé qui occasionnent des dépenses élevées et non-anticipées (chapitre 2)? L'assurance santé permet-elle de réduire efficacement cette vulnérabilité (chapitre 3)? Enfin, quelle est l'importance du mode de gestion pour la productivité de ces micro-entreprises (chapitre 4)? Tous les chapitres s'appuient en premier lieu sur des données d'enquêtes quantitatives, de première ou seconde main, et en deuxième lieu sur des enquêtes qualitatives. Les résultats dressent le portrait d'un secteur dynamique et suggèrent des politiques pour améliorer la productivité de ces entreprises opérant dans des conditions précaires.

Mots Clés

Développement, secteur informel, politiques publiques, microentreprises, choc de santé, assurance santé, capital managérial, productivité.

Abstract

This PhD dissertation is built around four main chapters. They handle questions about the informal sector that shall sound familiar to policy makers, and to all empirical economists working on microenterprises. They are indeed based on policy recommendations that could be summarized by the three following mottos: “formalize them”, “protect them”, and “train them”. Little of these recommendations rely on actual evidence of their effects on the firms themselves. The originality of this work lies in that it does ask these questions from the perspective of the micro-firms. The first chapter questions the relevance of formalization: what exactly do these production units have to gain from registration? The second chapter investigates the vulnerability of microenterprises to health problems: how much do they suffer from the consequences of health shocks in the household? The third chapter deals with the complementary question of the protection mechanisms, and questions the mitigating power of health insurance. The fourth chapter turns to their managerial capital: do the business skills that are considered standard among larger firms have any meaning for the productivity of informal micro enterprises?

Keywords

Development, informal sector, public policies, microenterprises, health shocks, health insurance, managerial capital, productivity.