

Essays in employment, banking system and structural transformations

Farshad Ranjbar Ravasan

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PANTHÉON SORBONNE

Essays in Employment, Banking System and Structural Transformations

Farshad R. Ravasan

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Introduction in French

I.1 Préface

Depuis 2000, le monde a connu de nombreux bouleversements politiques et des révoltes sociales étroitement liés à l'incapacité des économies de créer des emplois ou de prévenir leur destruction. Au cours du Printemps arabe, les jeunes ont exprimé leur frustration à l'égard d'économies qui n'étaient pas parvenues à créer suffisamment d'emplois durant la dernière décade. La montée du nationalisme d'extrême droite et le mécontentement grandissant lié à la globalisation s'expliquent en partie par l'échec des économies développées à empêcher l'accélération des destructions d'emplois dans leurs secteurs manufacturiers au sein d'une économie ouverte.

Mon premier chapitre tente d'expliquer le modèle des faibles taux de création d'emplois dans quatre économies du MENA qui partagent des caractéristiques communes. Premièrement, toutes ces économies se caractérisent par un environnement institutionnel parmi les plus médiocres au monde en termes de lois sur les garanties et les faillites. Deuxièmement, leurs systèmes bancaires sont éminemment dépendants des prêts collatéralisés et ces prêts sont assortis de niveaux de garanties très élevés. Troisièmement, les frictions financières sont principalement liées à la demande et attribuées aux emprunteurs découragés. Quatrièmement, malgré de faibles taux de création d'emplois, la démographie de la main d'œuvre jeune et éduquée montre un fort potentiel d'activité entrepreneuriale. Le premier chapitre soutient que dans ces économies ou la qualité institutionnelle des lois sur les garanties et les faillites est faible, la collatéralisation excessive rend la prise de risque sous-optimalement plus couteuse pour les emprunteurs. Cela décourage le potentiel entrepreneurial et entrave ainsi la croissance potentielle de jeunes entreprises ayant

un impact important sur la création d'emplois dans l'économie.

Alors que le premier chapitre se concentre sur l'étude des conséquences de la collatéralisation excessive sur la performance des entreprises à travers le canal du « découragement », le deuxième chapitre met l'accent sur le canal de « déconnexion». La région du MENA est caractérisée par une proportion inhabituellement élevée d'entreprises qui n'ont pas besoin de financement. Ces entreprises sont moins susceptibles de considérer l'accès au crédit comme une préoccupation majeure, d'avoir acquis des immobilisations, et de prévoir une opération de développement. Ces résultats tiennent également en tenant compte de l'ensemble des caractéristiques standards des entreprises. La proportion élevée de celles qui n'ont pas besoin d'un prêt reflète-t-elle un manque d'opportunités d'investissement ? Bien que plausible, cette perspective ignore le fait que les opportunités d'investissement sont dans une certaine mesure endogènes. Les contraintes financières peuvent conduire les entreprises à ajuster leur niveau d'activité de manière à réduire au minimum leur dépendance à l'égard de financements extérieurs. Les contraintes financières pourraient donc décourager les entreprises de s'engager dans des activités à croissance rapide qui nécessitent plus d'investissements et une plus grande dépendance vis-vis de fonds externes. Dans ce cas, les entreprises choisissent stratégiquement de se déconnecter du secteur financier, et par conséquent, elles poursuivent des activités moins exigeantes en termes d'investissements. Nous étudions ensuite comment la politique de collatéralisation impacte les performances des entreprises à travers le canal de « déconnexion ».

Dans le troisième chapitre, je passe à un échantillon de pays de l'OCDE. Une littérature croissante souligne le rôle du commerce avec les économies émergentes, en particulier la Chine, dans la destruction des emplois dans le secteur manufacturier comme dans le processus de désindustrialisation des économies avancées. Cependant, pour quantifier la pertinence de l'exposition aux importations en provenances des marchés émergents, nous devons démêler le canal commercial du canal de productivité traditionnel. Dans ce chapitre, nous développons un modèle simple du changement structurel dans une économie ouverte pour en déduire des implications empiriques que nous analysons pour un échantillon de pays de l'OCDE. Le

modèle est basé sur le commerce entre les économies avancées et émergentes. Dans le concept d'une économie fermée, une augmentation plus forte de la productivité dans le secteur manufacturier induit une diminution de la part de ce secteur dans l'emploi total mais pas dans la valeur ajoutée totale. En revanche, dans les économies ouvertes, ce qui importe n'est pas seulement la croissance relative de la productivité manufacturière par rapport aux services, mais la croissance relative de la productivité manufacturière domestique par rapport à la productivité étrangère. Lorsque la croissance de la productivité de l'industrie nationale est plus rapide que celle des services, mais plus lente que celle de l'industrie étrangère, alors la part industrielle peut diminuer dans les économies avancées, tant en valeur ajoutée qu'en emplois. Nous appelons ce phénomène « double désindustrialisation ». Nous exploitons la comparaison entre les estimations de l'emploi et de la valeur ajoutée pour identifier l'importance du canal commercial par rapport au canal de la productivité pure. Nous trouvons des effets significatifs et quantitativement pertinents du commerce sur le changement structurel dans les économies avancées. En outre, alors que de nombreuses études étudient l'accélération de l'ampleur des importations en provenance de Chine depuis 2000 pour expliquer le modèle de désindustrialisation dans les économies avancées, nous soulignons que l'évolution de la composition des exportations chinoises vers les secteurs des technologies d'information et de communication et la naturante changeante du progrès technologique dans les économies émergentes pourraient contribuer à la compréhension du phénomène de désindustrialisation post-2000.

I.2 Environnement collatéral et système bancaire dans les pays du MENA

Dans la région du MENA, le secteur financier formel est dominé par les banques. D'après la Banque Européenne pour la Reconstruction et le Développement (EBRD et al. (2016)), les dépôts bancaires représentent 88% du PIB des huit économies incluses dans ce rapport. Cela doit être comparé à seulement 48% en moyenne pour les économies à revenu moyen supérieur. La taille importante des secteurs bancaires reflète leurs capacités à absorber les dépôts grâce à des envois de fonds et

des entrées de capitaux considérables (Rocha et al. (2011)). En 2012, les économies du MENA ont attiré des envois de fonds d'un valeur de 9,6% du PIB, contre une moyenne de 3,5% pour les économies à revenu moyen supérieur. De plus, une série de réformes et la déréglementation des marchés de capitaux facilitent la libéralisation des flux de capitaux internationaux.

Toutefois, relativement peu de ces importants dépôts reçus par les banques sont traduits par des prêts au secteur privé non financier, conduisant à de faibles ratios prêts/dépôts dans la région. A 59%, les ratios prêts/dépôts sont bien inférieurs aux moyennes pour toutes les tranches de revenus (EBRD et al. (2016)). Cela suggère que les banques de la région MENA semblent avoir adopté une approche conservatrice face à un environnement d'incertitude élevé sur le marché du crédit. Ceci est en partie attribué à la forte instabilité politique locale qui a submergé la région MENA depuis le début des années 2000. Bien que chaque état de la région présente une combinaison spécifique de problèmes intérieurs, il existe un modèle général d'instabilité politique qui est stimulé par une série d'événements survenus après 2000. L'invasion de l'Irak en 2003, le développement de l'Etat islamique depuis 2006, et l'escalade de changements démographiques et sociaux qui a éclaté lors du Printemps arabe. Par ailleurs, les tendances mondiales et deux crises financières au cours des années 2000 ont également impacté les marchés financiers de la région à travers des canaux contingents.

La figure II.5 compare l'indice de stress financier pour les économies avancées avec celui des pays du MENA [1] (tiré de Rocha et al. (2011) et de Cardarelli et al. (2011)) où l'indice de stress financier de chaque groupe est la moyenne des indices de chaque pays qui les composent. L'index de stress financier (ISF) résume un certain nombre de canaux et de facteurs transmettant les retombées de la crise mondiale aux pays de la région MENA. Il se compose d'un indice de pression du marché des changes et de quatre indicateurs de prix basés sur le marché (spreads souverains, risque du secteur bancaire, rendements boursiers, et volatilité des marchés financiers), où chaque composante est normalisée. Une augmentation des ISF indique un stress financier accru dans une économie. Rocha et al. (2011)

[1] Egypt, Jordan, Lebanon, Morocco, Pakistan and Tunisia

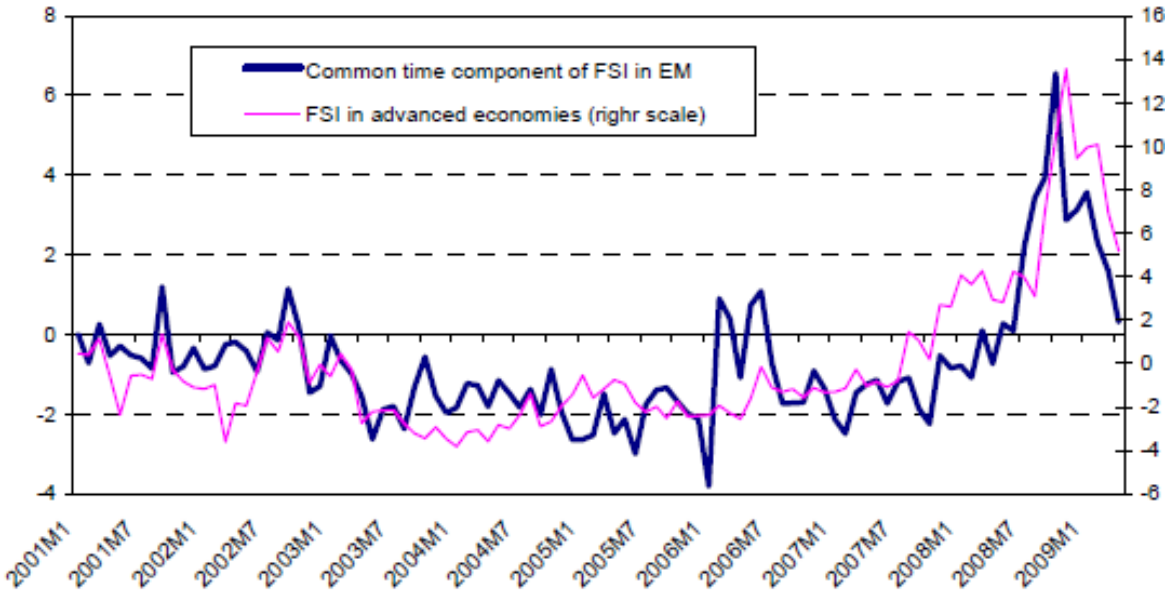


Figure I.1: Stress financier dans la région MENA

affirment que les retombées des tensions financières des économies avancées expliquent en grande partie les périodes de fortes tensions dans les pays de la région MENA. L'impact direct de niveaux de stress financier élevés est la diminution des envois de fonds ainsi que la chute soudaine des entrées de capitaux, dues aux conséquences du ralentissement de l'activité économique de leurs principaux partenaires commerciaux. Leurs résultats indiquent que près des deux tiers de la pression financière dans les économies émergentes des pays de la région MENA après la faillite de Lehman Brothers est attribuable aux retombées du stress financier dans les économies avancées. Une forte baisse de l'afflux d'envois de fonds se traduira par un changement d'EMPI puisque les fonds envoyés sont généralement utilisés pour financer les déficits des balances commerciales et des services ; et une variation significative des entrées de capitaux pourrait être associée à de fortes variations des cours des actions, des réserves internationales, des spreads souverains et des taux de change. La figure II.6 montre le ratio des prêts non performants (NPL) dans la région MENA au cours des années 2000. Les données proviennent de la base de données Global Financial Development Database et mesure le ratio de prêts non performants comme la part des prêts dont le paiement des intérêts échus est en défaut depuis 90 jours ou plus par rapport à la valeur brute totale des prêts. Le montant du prêt comptabilisé comme non performant comprend la valeur brute du

prêt inscrite au bilan, et pas seulement le montant en souffrance.

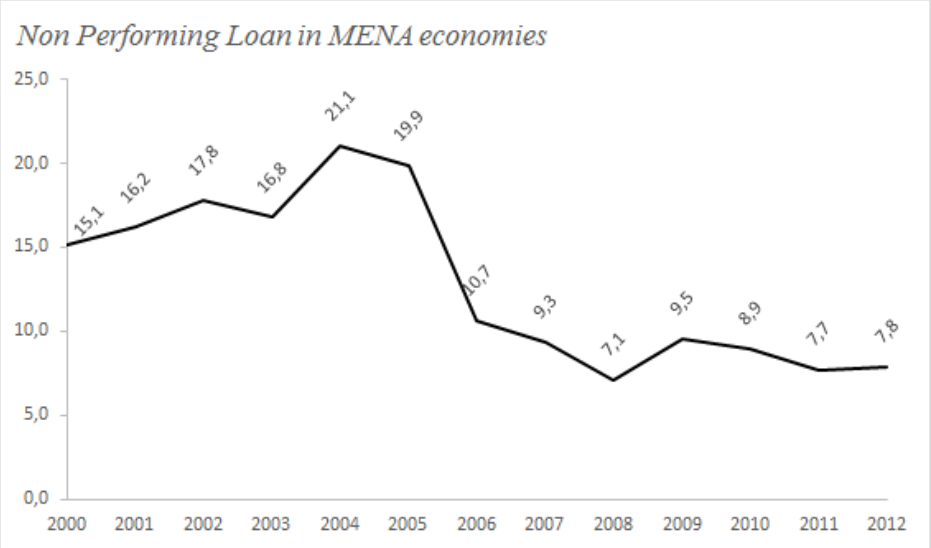


Figure I.2: : Prêts non performants dans la région MENA

Les données de la Figure II.6 indiquent que la dynamique des prêts non performants dans la région MENA se divise en deux périodes au cours des années 2000. La part des prêts non performants augmente pendant la fenêtre temporelle du début des années 2000 qui contient deux périodes de stress financier important en 2001 et 2003. Cependant, les banques ont réussi à maintenir le ratio des prêts non performants faible pendant la seconde moitié des années 2000, bien que les économies de la région MENA aient connu une période de forte tension financière, notamment après la chute de Lehman.

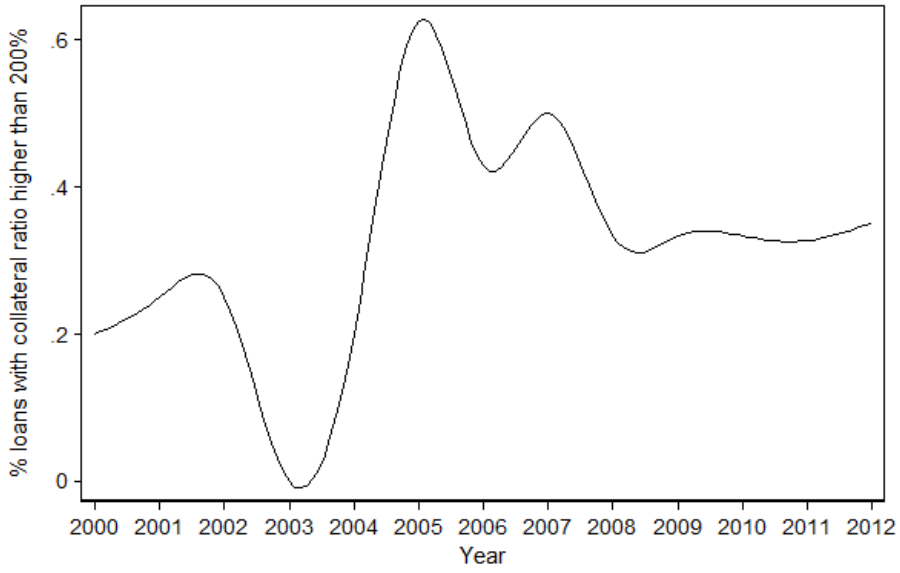


Figure I.3: Collatéralisation dans la région MENA

Ce changement significatif est attribuable à l'ajustement structurel des comportements d'octroi de crédit des banques. Les banques de la région MENA semblaient compter sur une collatéralisation agressive pour répondre à l'environnement des affaires du début des années 2000 marqué par un ratio élevé de prêts non performants. La figure 1.3 indique le ratio de garantie exigé au moment du déblocage des fonds prêtés dans quatre pays de la région MENA : l'Egypte, le Liban, le Maroc, et la Tunisie. La figure 1.3 montre que la politique d'exigence de garanties reflète étroitement l'évolution des prêts non performants dans la région. L'explication théorique vient de la littérature sur l'information asymétrique qui souligne l'utilisation généralisée des garanties sur les marchés du crédit lorsqu'il existe un déficit informationnel significatif sur la qualité des prêts. Cette littérature illustre le rôle de la garantie pour faciliter l'octroi de prêts dans un cadre marqué par les informations asymétriques sur la qualité de l'emprunteur ou son comportement futur qui pourrait potentiellement avoir une incidence sur le résultat du prêt (Stiglitz and Weiss (1981)). L'apport d'une garantie pourrait agir comme un instrument de signalisation ou un dispositif de tri. Cela atténue le problème de sélection adverse ex ante, avant la signature du contrat de prêt (Besanko and Tjakor (1987b), Bester (1985)). En outre, il pourrait corriger l'incitation de l'emprunteur ex post, en atténuant le problème de l'aléa moral (Besanko and Tjakor (1987a), Bester (1994)). Cependant,

la corrélation entre la qualité des prêts et l'exigence de garantie est très dépendante des technologies de prêt des banques dans la région MENA. Les banques de cette région suivent principalement un business model qui limite leurs capacités à filtrer et recueillir des informations précises sur les demandeurs via des techniques de prêts telles que la notation de crédit, les prêts garantis par un actif, et l'affacturage. Si ils étaient confronté à une situation où le cycle du crédit tournerait rapidement, il deviendrait extrêmement difficile pour les services de crédit de ces établissements de prédire les perspectives de leurs emprunteurs avec peu d'informations précises les concernant (Beck et al. (2017)). Dans un tel cas, les banques s'appuient sur la collatéralisation pour se protéger contre les risques observés et non-observés de leurs emprunteurs.

Cependant, il est intéressant de noter que dans les économies émergentes les banques utilisent leurs relations bancaires avec les prospects pour compenser le manque d'informations précises. Les banques pourraient acquérir de précieuses informations via une interaction répétée et en développant une relation avec les emprunteurs. Il a été démontré qu'une telle proximité entre la banque et l'emprunteur pourrait permettre aux établissements bancaires de surmonter les problèmes d'information asymétrique et d'atteindre des emprunteurs qui seraient autrement opaques (Boot (2000)). L'impact sur l'exigence de garantie de la technique de prêt relationnel n'est néanmoins pas clair. Boot et Thakor (2000) montrent que si une banque obtient des informations spécifiques sur un client dans le cadre d'une relation de prêt à long terme, elle réduit les exigences de collatéral pour les emprunteurs qui réussissent. D'autre part, le prêt relationnel crée un avantage comparatif pour le prêteur relationnel par rapport aux prêteurs transactionnels. L'information supérieure acquise donne aux prêteurs relationnels un monopole informationnel qui se renforce pendant une période de forte tension financière, puisque les emprunteurs ont peu d'occasions d'obtenir plus de crédit auprès de prêteurs transactionnels (moins informés) ou de commencer de nouvelles relations. Les banques désireuses d'augmenter leurs bénéfices pour renforcer leurs ratios de capital peuvent être particulièrement disposées à renforcer leurs exigences de garanties pour exploiter des bénéfices plus élever et ainsi renforcer leurs ratios de capital. Dans ce cas les em-

prunteurs sont enfermés dans la relation (hypothèse du hold-up). Cela permet au prêteur d'obtenir un avantage informationnel et un pouvoir de négociation ex post pour fixer et réajuster les conditions de la garantie en faveur du créancier (Greenbaum et al. (1989) ; Sharpe (1990) ; Rajan (1992) ; Menkhoff et al. (2006) ; Sette et Gobbi (2015)). De plus, Menkhoff et al. (2006) soutiennent que pour une banque privée, fournir des services spéciaux à ses clients, en termes d'assurance de liquidité ou de renégociation de contrats de dette peut exiger une garantie plus élevée pour être rémunérée pour la fourniture de ces services, puisqu'elles sont normalement les premières à prêter et sont les plus flexibles pour renégocier les conditions avec leurs clients. Les banques privées peuvent également avoir besoin d'être rassurées à un plus haut niveau pour accepter de prendre le risque d'entrer et de développer une relation de long terme avec certains emprunteurs (Menkhoff et al. (2006)).

Les évidences empiriques qui montrent comment évoluent les termes collatéraux selon les techniques de prêt (relation vs. transaction) sont plutôt rare dans les économies émergentes Menkhoff et al. (2006) présentent des données empiriques fondées sur 560 dossiers de crédits de neufs banques commerciales thaïlandaise au cours des années 1992-1996. Leurs résultats indiquent que les banques thaïlandaises exigent des garanties supplémentaires, ceteris paribus lorsque les prêteurs et les emprunteurs sont engagés dans des relations de banque privée.

I.3 Qualité des législations de résolution des garanties et des faillites dans les pays du MENA

Dans la finance traditionnelle, les contrats de prêt était auparavant évalués et comptabilisés en fonction des flux de trésorerie qu'ils génèrent, flux qui sont la concrétisation des flux d'intérêts fixes liés à l'emprunt. Cependant, des études contemporaines ont montré que les droits attachés aux contrats sont importants et qu'ils participent de manière substantielle à la définition des caractéristiques des titres de dette (Hart (1995)). Par exemple, les caractéristiques du crédit donnant droit aux créanciers de déposséder l'entreprise débitrice de la garantie apportée à leur profit lorsque celle ci ne parvient pas à honorer les échéances de l'emprunt. Sans ce

droit, ou en absence de leur application, les investisseurs ne seraient pas en mesure d'être repayés, et il serait par conséquent plus difficile encore pour les entreprises d'accéder à des financements externes via des crédits. Ainsi, un créancier garanti par le même type et le même montant de collatéral peut être amené à évaluer différemment face à des contrats de prêt à priori similaire mais émis dans des juridictions différentes. Les garanties collatérales sont des instruments qui permettent de sécuriser le devenir du contrat en cas de défaut. Cependant, l'efficacité de ces instruments contractuels se rapporte au coût transactionnel de leur réalisation en cas de défaillance du débiteur. Ces coûts transactionnels indiquent la qualité institutionnelle des systèmes judiciaires. Les coûts élevés de la collatéralisation dans les économies en développement proviennent soit de la faiblesse des systèmes et règles judicaires relatives aux droits des investisseurs, soit par la mauvaise qualité de leur application (Porta et al. (1998)).

Le droit des créances dans différents pays n'est rarement unique et est principalement dérivé de quelques familles de pensée juridique (Watson (1974)). En général, le droit commercial est issu de deux grandes traditions juridiques : la common law, d'origine anglaise, et le droit civil, d'origine française. Dans la tradition civile, il y a trois grandes familles d'influence dans les domaines commerciaux et financiers : le français, l'allemand, et le scandinave. Les traditions civiles française et allemande, comme la tradition du droit commun, se sont progressivement répandues dans les pays émergents par un mélange historique de conquêtes, d'impérialisme, de duplications ou par des imitations plus subtiles. Les lois qui en résultent reflètent à la fois l'influence de leurs familles et les révisions propres à chaque pays (Porta et al. (1998)). Les législations commerciales dans les pays de la région MENA ont été dérivées de la tradition civile française puis révisées pour se conformer aux lois de la Charia.

Le droit civil accorde aux investisseurs des droits légaux généralement plus faibles que ceux issus du droit commun, indépendant du niveau de revenu par habitant des pays concernés. Les pays régis par le droit commun accordent aux actionnaires et créanciers les droits les plus forts, et les pays régis par le droit civil français les protections les plus faibles. Les pays régis par le droit civil allemand et d'origine

scandinave se situent généralement entre les deux autres.

L'ensemble des lois existantes sur les créances, ou ce que Degryse et al. (2016) appellent « rules in the book » représente le niveau de pouvoir accordés aux créanciers détenteurs d'obligations sécurisés dans les procédures de faillite. Porta et al. (1997) et Djankov et al. (2007) ont construit un indice sur la qualité des « rules in the book » à partir de quatre indicateurs. En premier lieu les restrictions applicables durant la restructuration. Deuxièmement, la capacité d'un créancier à saisir une garantie une fois qu'une demande de restructuration a été approuvée (pas de suspension automatique). Troisièmement, la question de savoir si les créanciers garantis sont payés en premier (les créanciers garantis d'abord). Enfin, un quatrième facteur si la direction initialement en place ne conserve pas le contrôle de l'entreprise durant la restructuration (la direction ne gère pas).

De plus, Porta et al. (1998) indiquent que la qualité de l'application de la loi est la plus élevée dans les pays scandinaves et les pays dont la législation est issue du droit civil allemand, puis dans les pays utilisant le droit commun, et à nouveau, la plus faible dans les pays dont les systèmes juridiques sont issus du droit français. Il utilisent pour ce faire un indice de « l'état de droit » qui est construit à partir de la moyenne des évaluations mensuelles de l'environnement légal effectuées par des investisseurs dans 49 pays entre 1982 et 1985. En outre, l'efficacité du système juridique est également négativement corrélée avec l'origine française lorsqu'elle est mesurée par le nombre de jours nécessaire à l'exécution des contrats (Djankov et al. (2003) et Djankov et al. (2007)). Les économies des pays de la région MENA connaissent des coûts de transaction sur les contrats de dette sécurisée élevés pour diverses raisons. La Turquie dispose d'un système judicaire relativement efficace tandis que la qualité institutionnelle du droit des créanciers est substantiellement faible. D'un autre côté, bien qu'ayant un droit d'une qualité exceptionnellement bonne en matière de créances sécurisée et des garanties, le Liban souffre de la faible efficacité de son système judiciaire qui est mesurée par d'anormaux délais de résolutions des contrats par Djankov et al. (2008). La qualité du droit sur les garanties et les faillites est mesurée par l'enquête Doing Business 2013 de la Banque Mondiale grâce à un indice variant de 0 à 12, un score élevé traduisant un cadre légal conçu

pour élargir l'accès au crédit. Cet indice s'est développé à partir de l'index LLSV (Porta et al. (1997)), étendu par Djankov et al. (2007) et ouvert ensuite à un plus grand nombre de pays (Djankov et al. (2016)). La figure II.8 compare les économies des pays de la région MENA avec des économies émergentes situées dans d'autres régions. La figure II.8 indique que les prêts sont assortis de niveau de garanties extrêmement élevés dans cette région alors que la qualité des lois sur les garanties et les faillites y est particulièrement faible par rapport aux pays en développement d'autres régions.

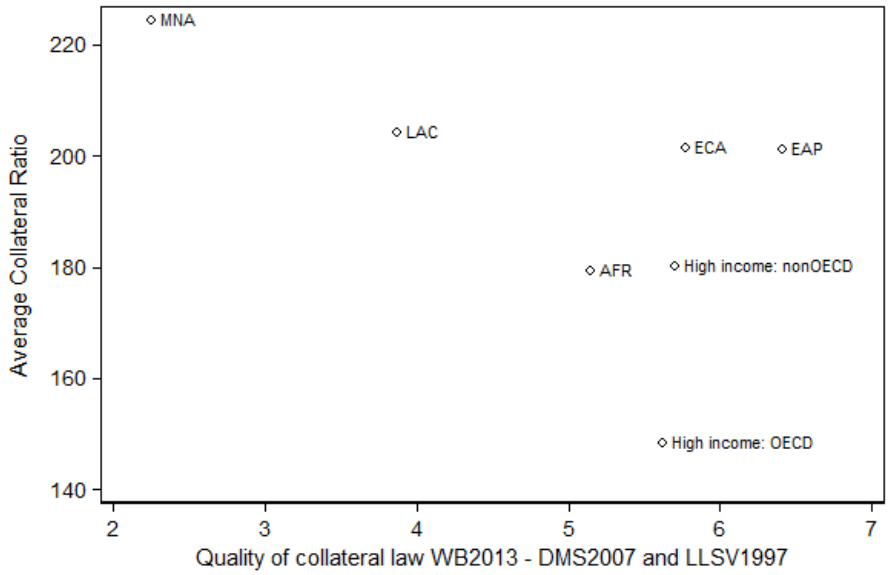


Figure I.4: Prêts garantis et qualité des lois sur les garanties (Enquête Doing Business 2013 de la Banque Mondiale)

Cet environnement à haut niveau de garantie requis est accompagné par un modèle de contraintes financières unique. Les données concernant les entreprises issues du Moyen-Orient et de l'Afrique du Nord (MENA ES) indiquent que les contraintes financières s'y définissent principalement par une faible demande et des emprunteurs découragés. De plus, cette contrainte induite par la demande est fortement préjudiciable aux jeunes entreprises : elle peut en effet les empêcher de concrétiser leur potentiel de croissance et de création d'emplois.

I.4 La répartition de la création des emplois au cours du cycle de vie et des entreprises et son rôle sur la création d'emplois

Les jeunes entreprises à forte croissance ont joué un rôle essentiel dans la robuste croissance de l'emploi connue par les Etats-Unis dans les années 1980 et 1990. A cette époque, le rythme de la dynamique des jeunes entreprises était très élevé. Bon nombre de ces jeunes entreprises qui sont au premier stade de leur cycle de vie ne n'ont pas cru significativement, certaines ont même échoué, mais une petite fraction d'entre elles a connu une croissance très rapide. Ces jeunes entreprises à forte croissance ont généré une contribution soutenue et disproportionnée par rapport à la moyenne des jeunes entreprises à la création d'emplois américaine. De plus, la riche dynamique qui existe au sein des jeunes entreprises, certaines affichant une croissance élevée, et d'autres une contraction, aide à réorienter l'emploi des entreprises à croissance lente et moins productives vers des entreprises plus innovantes et à croissance rapide. Ainsi, ce mouvement contribue positivement à la création d'emplois en améliorant l'efficacité de la dynamique d'allocation des ressources vers les parties les plus productives de l'économie (Decker et al. (2014)). Cette dynamique découlant de l'apparition des jeunes entreprises rend la répartition de la création d'emplois entre entreprises fortement et positivement asymétrique. Decker et al. (2014) montrent que les jeunes entreprises ont une très forte asymétrie. Elle est observée dans les amplitudes relatives entre les 90ème et 10ème centiles de la répartition de la croissance des emplois, où les taux de croissance des entreprises plus jeunes sont beaucoup plus asymétriques vers la droite (positif) que les entreprises plus matures. Cela explique globalement la répartition fortement asymétrique et positive de la distribution de la croissance des emplois par entreprise.

Decker et al. (2014) documentent que le différentiel 90-50 pour les jeunes entreprises (celles ayant moins de cinq ans) survivantes est d'en moyenne d'environ 63 points de pourcentage, soit 17 points de plus que le différentiel 50-10. Cela contraste avec la distribution du taux de croissance assez symétrique pour les entreprises matures (celles ayant plus de cinq ans), qui ont à la fois un différentiel

de 90-50 et un différentiel de 50-10 à 22 points de pourcentage. Ainsi, les taux de croissance des jeunes entreprises génèrent une forte asymétrie positive dans la répartition de la croissance des entreprises.

Decker et al. (2016) notent que la contribution des jeunes entreprises à forte croissance à la création d'emplois aux Etats-Unis et les tendances de l'asymétrie positive dans la répartition des taux de croissance des entreprises changent. Ils démontrent que la période post-2000 a connu une baisse du nombre de jeunes entreprises à forte croissance et que, par conséquent, l'asymétrie positive de la distribution des taux de croissance a considérablement diminué après 2000. En 1999 la différence entre le 90ème centile et le 50ème centile dans la répartition du taux de croissance de l'emploi dans les entreprises était de 31 points de pourcentage. Elle était supérieure de 16% à la différence entre le 50ème et le 10ème centile, ce qui reflète une asymétrie considérable. Mais à partir de 2000, cette différence est engagée dans une tendance à la baisse. En 2007, le différentiel 90-50 était seulement 4% plus grand que le 50-10. La tendance à la baisse de l'asymétrie s'est poursuivie en 2011. Ces preuves fournissent des indications sur la façon dont la répartition de la création d'emplois au cours du cycle de vie des entreprises pourrait explique le ralentissement séculaire de la création d'emplois dans la période post-2000. Crisculo et al. (2014) fournissent des éléments qui confirment la même tendance à la baisse de l'activité des jeunes entreprises entre 2001 et 2011 dans de nombreux pays européens et dans d'autres pays développés.

De ce point de vue, on observe que l'asymétrie positive est également très faible dans la répartition de la croissance de l'emploi dans quatre économies de la région du MENA à travers les données de l'année fiscale 2012. La différence entre le 90ème centile et le 50ème centile dans la répartition du taux de croissance de l'emploi était de 16 points de pourcentage. Cette différence n'était que de 3% plus élevée que la différence entre le 50ème et le 10ème centile. Le différentiel 90-50 pour les jeunes entreprises est beaucoup plus élevé à 35 points de pourcentage, soit 25% de plus que l'écart 50-10.

Nous prouvons que l'asymétrie positive dans la distribution de la croissance de l'emploi des jeunes entreprises est principalement générée par les jeunes entreprises qui opèrent dans les localités où les banques ayant des politiques de crédit exigeant des niveaux de garantie moins stricts ont une présence plus forte. Dans ces localités, le différentiel 90-50 pour les jeunes entreprises est supérieur de 10 points de pourcentage à celui des jeunes entreprises dans les localités où les exigences de garantie sont moins favorables.

I.5 La répartition de l'emploi entre les secteurs et son rôle sur le niveau d'emploi

Durant des décennies, la majorité des grandes innovations dans la fabrication des produits a été initialement conçue pour remplacer le travail humain. Elles ont été développées soit pour substituer de la puissance mécanique au travail physique, soit pour remplacer le travail humain dans les domaines où il ne peut rivaliser avec la précision des machines. La nature et le but mêmes de ces inventions ont été de remplacer la sous-optimale et couteuse main d'œuvre sans avoir l'intention initiale de faire évoluer, élargir, ou redéfinir la demande. Les phénomènes d'automatisation ne se limitent pas à la fabrication de biens mais couvrent également la plupart des secteurs à croissance rapide et à fort niveau d'innovation dans les services. Cela implique une automatisation qui pourrait sur le long terme conduire à une dynamique inefficace dans la réallocation de l'emploi vers les secteurs stagnants de l'économie. Cela soulève de sérieuses inquiétudes quant à l'avenir de l'emploi dans les économies avancées. Cependant, il semble que l'examen plus approfondi des données au niveau des différentes industries suggère que les choses pourraient ne pas suivre ce schéma pessimiste.

Bessen (2016) fournit un exemple intéressant sur les distributeurs automatiques de billets (DAB) et l'emploi des caissiers. Les DAB sont parfois considérés comme un cas paradigmatique de technologie se substituant aux travailleurs : les DAB ont pris en charge les tâches liées au traitement des espèces, mais le nombre de caissier de banque en équivalent temps plein (ETP) a augmenté depuis le milieu

des années 1990 où les guichets automatiques ont été largement déployés. En effet, depuis 2000 le nombre de caissiers en ETP a augmenté de 2,0% par an, soit beaucoup plus rapidement que la population active. Il souligne que les DAB permettent aux banques d'exploiter des succursales à moindre coût : cela les a incités à ouvrir beaucoup plus de succursales, compensant la perte des emplois des caissiers initialement remplacés par les machines.

C'est ce facteur clé qui a été généralement ignoré dans la littérature sur les changements structurels. Bien que le mécanisme des prix et les coûts liés aux maladies impliquent des changements technologiques, la demande de main d'œuvre dans les secteurs les plus avancés à moyen terme diminue, ce qui rend la production moins couteuse et plus rentable pour les entreprises.

Cela incite fortement les entreprises à investir et à développer leurs capacités, ce qui pourrait sur le long terme compenser en partie l'effet de Baumol. En ce qui concerne les données à basse fréquence sur les changements structurels, cela se traduit par des divergences entre les changements structurels de la valeur ajoutée et la part de l'emploi du secteur concerné dans l'économie. Même si le changement technologique pourrait réduire la part de l'emploi, il laisserait la part de valeur ajoutée intacte ou même l'augmenterait dans des secteurs plus avancés.

Introduction in English

The post 2000 period has seen much political turmoil and social upheaval throughout the world that was closely interconnected with economies' failure to create jobs or avoid their destruction. One example was the Arab spring, during which young people voiced their frustration at economies that had failed to create enough jobs over the preceding decade. On the other hand, the rise of far-right nationalism and the growing discontent with globalization in developed countries can be partly attributed to the failure of developed economies to impede the acceleration of job destruction in their manufacturing sectors in an open economy world.

My first chapter tries to explain the pattern of low job creation rates in four MENA economies that share four common traits. First, all of these economies feature some of the poorest institutional quality in the world in terms of collateral and bankruptcy laws. Second, the banking systems in these economies are eminently dependent on collateral lending, and loans are collateralized at a very high rate. Third, financial friction is mostly demand-driven and attributed to discouraged borrowers. Fourth, in spite of low job creation rates, the demography of a young and highly educated labor force shows high potential for entrepreneurial activity.

The first chapter argues that, in these economies with poor institutional quality of collateral and bankruptcy laws, aggressive collateralization makes the risk-taking behavior of borrowers suboptimally more costly. This discourages entrepreneurship and thus impedes the growth potential among young firms with a potentially high impact on job creation in the economy.

While the first chapter concentrates on investigating the impact of aggressive collateralization on firms' performance through the "discouragement" channel, the second chapter stresses the "disconnection" channel.

The MENA region is characterized by an unusually high share of firms that do not need external finance. These firms are less likely to view access to finance as a major concern, are less likely to have purchased fixed assets, and are less likely to plan further expansion. These findings also hold after accounting for a standard set of firm characteristics.

Does the high share of firms that do not need loans reflect a lack of investment opportunities? While plausible, this perspective ignores that investment opportunities are to some extent endogenous. Financial constraints can lead firms to adjust their economic activity so as to reduce their reliance on external finance to a minimum. Financial constraints could therefore discourage firms from being fast-growing businesses that require more investment and entail a greater dependence on external funds. If this were true, firms would strategically choose to disconnect from the financial sector and therefore pursue activities that are less demanding in terms of investment. I then go on to investigate how collateral policy can impact firms' performances through this "disconnection" channel.

In the third chapter, I move to a sample of OECD countries. A growing body of literature emphasizes the role of trade with emerging economies, especially with China, in job destruction in the manufacturing sectors and in the deindustrialization process currently seen in advanced economies. However, to quantify the relevance of exposure to imports from emerging markets, the trade channel needs to be disentagled from the traditional productivity channel.

In this chapter, I develop a simple model of structural change in an open economy to derive empirical implications, which I go on to analyze for a sample of OECD countries. The model is based on trade between advanced and emerging economies.

In a closed economy framework, higher productivity in manufacturing induces a fall in the share of manufacturing in total employment but not in total added value. By contrast, in open economies, what matters is not only the relative growth of productivity in manufacturing versus domestic services, but also the relative productivity growth of domestic versus foreign manufacturing. When productivity growth of domestic manufacturing is faster than that of services but slower than that of foreign manufacturing, the share of manufacturing in advanced economies may fall, both in terms of value added and of employment. I call this phenomenon "twin deindustrialization". I proceed to compare estimates for the relative impacts on employment and on value added to identify the importance of the trade channel relative to the pure productivity channel. My analyses find significant and quantitatively relevant effects of trade on structural change in advanced economies.

Furthermore, while many studies investigate the accelerating volume of imports from China post 2000 to explain the pattern of deindustrialization in advance economies, I stress that the shift in the composition of Chinese exports towards the ICT sectors and the changing nature of technological progress occurring in emerging economies are important considerations in understanding the pattern of deindustrialization in the post 2000 period.

II.1 Collateral environment and banking system in MENA countries

In the MENA region, the formal financial sector is dominated by banks. According to EBRD et al. (2016), bank deposits account for 88 percent of GDP in the eight economies of the MENA region included in the authors' analysis. This compares to only 48 percent on average in upper-middle-income economies. The large size of the banking sectors reflects their capacity to absorb deposits through sizeable remittances and capital inflows (Rocha et al. (2011)). In 2012, the MENA ES economies attracted remittances worth 9.6 percent of GDP, compared to an average of 3.5 percent for upper-middle-income economies. Furthermore, a series of policy reforms and capital market deregulation measures has facilitated the liberalization of inter-

national capital flows.

However, relatively little of these sizable deposits received by banks are translated into lending to the non-financial private sector, leading to low ratios of loans to deposits. At 59 percent, loan-to-deposit ratios in the region are well below the averages for all income brackets (EBRD et al. (2016)). This suggest that banks in the MENA region have adopted a conservative outlook faced with a high uncertainty environment in the credit market. This is partly attributed to the MENA-specific high political instability that has overwhelmed the region since the early 2000s. Although each state in the region faces a different mixture of civil problems, there is an overall pattern of political instability which has been driven by a number of events in the post-2000 period. Examples include the Iraq invasion in 2003, the rise of Islamic State since 2006 and the escalating demographic and social changes leading to the Arab spring. On top of regional events, global trends and two financial crises during the 2000s have also impacted the region's financial markets through the contingents channel.

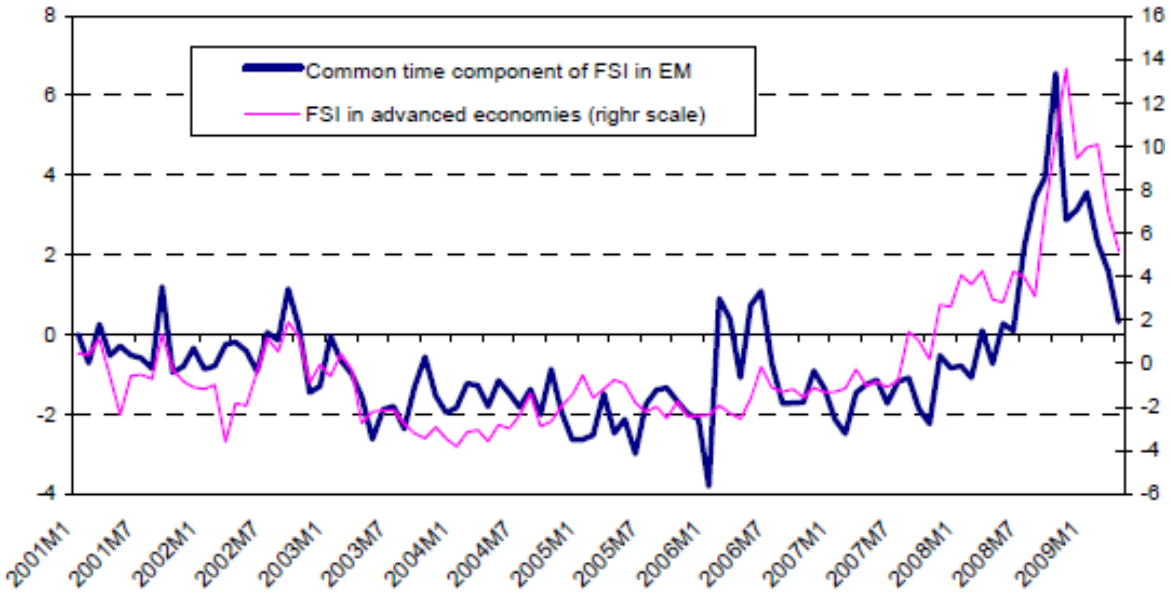


Figure II.5: Financial Stress in MENA region

Figure II.5 compares a financial stress index covering the period from January 2001 to March 2009 for advanced economies and selected MENA countries[2] (taken

[2]Egypt, Jordan, Lebanon, Morocco, Pakistan and Tunisia

from Rocha et al. (2011) and Cardarelli et al. (2011)), where each country-by-country Financial Stress Index is simply averaged over countries in each group. The financial stress index (FSI) summarizes a certain number of channels and factors transmitting the spillovers of the global crisis to MENA countries, including an exchange market pressure index and four market-based price indicators (sovereign spreads, banking sector risk levels, stock market returns, and stock market volatility), where each component is normalized. A rising FSI indicates increased financial stress in an economy. Rocha et al. (2011) argue that the financial stress spillover from advance economies substantially accounts for high financial stress periods in MENA countries. A direct impact of higher financial stress can be seen for the lower inflow of remittances and a sudden stop of capital inflows, while indirect effects are also observed through the slowdown of the economic activity of countries' major trade partners.

These studies indicate that nearly two thirds of the increased financial stress in MENA EM countries after the Lehman shock was attributable to the spillovers of financial stress in advanced economies. A sharp drop in the inflow of remittances is translated into a change in EMPI since remittances are generally used to finance trade and service account deficits. Dramatic change in capital inflows could be associated with sharp changes in stock prices, international reserves, sovereign spreads and exchange rates.

Figure II.6 shows the Non-performing loans (NPL) ratio in MENA economies during the 2000s (Egypt, Lebanon, Morocco and Tunisia). Data are drawn from the Global Financial Development Database and measure the NPL ratio as the share of defaults on interest payments of interest due for 90 days or more to the total gross value of loans. The loan volume recorded as non-performing includes the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue.

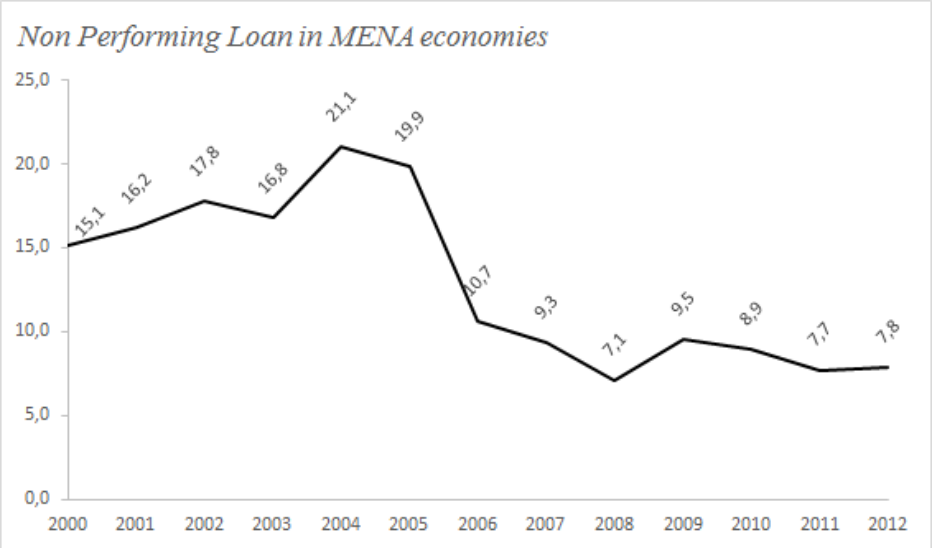


Figure II.6: Non performing loans in MENA region

Figure II.7 indicates the split seen in Figure II.6 of the dynamic of non-performing loans in the MENA region during the 2000s' into two different periods. The volume of non-performing loans rises during the the early 2000s, a time window containing two important high financial stress periods (in 2001 and 2003). However, banks managed to keep the NPL ratio low during the second half of 2000s in spite of the high financial stress experienced by MENA economies over this period, especially after the Lehman shock.

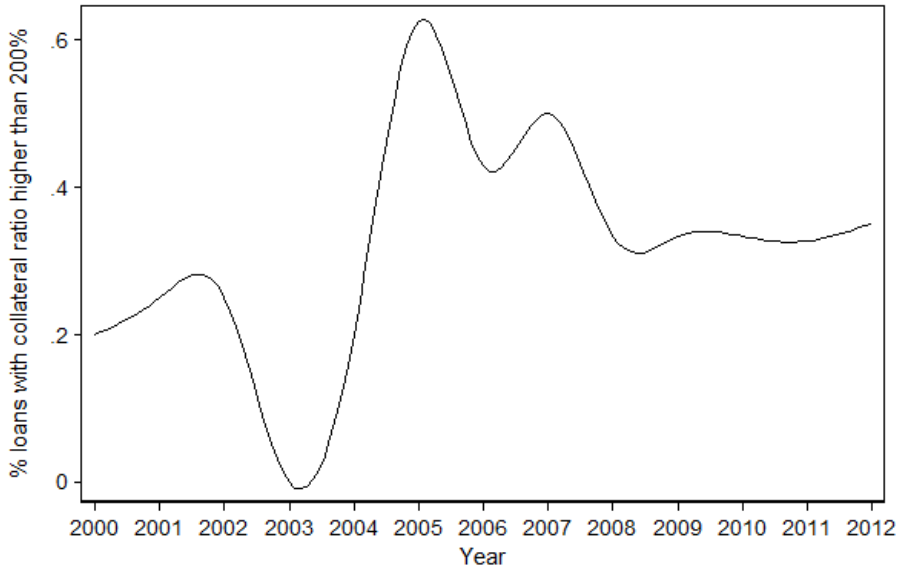


Figure II.7: Evolution of collateral requirement

This significant change is attributable to structural adjustment in banks' lending behaviors. In the early 2000s, banks in the MENA region seemed to rely on aggressive collateralization to respond to the risky business environment, which featured a high ratio of non-performing loans. Figure II.7 shows the collateral ratio as the share of collateral requirements relative to initial loan amounts in four MENA countries (Egypt, Lebanon, Morocco and Tunisia). Figure II.7 illustrates that collateral policy closely mirrors the evolution of non performing loans in the region.

A theoretical explanation of this phenomenon is provided by asymmetric information literature, which notes the widespread use of collateral in credit markets when there is a substantial informational gap about the quality of loans. This literature illustrates the role of collateral in facilitating lending in conditions of asymmetric information about borrower quality or future behavior that could potentially impact the outcome of the loan (Stiglitz and Weiss (1981)).

Collateral can act as a signaling instrument or sorting device. This alleviates the adverse selection problem ex ante before a loan contract is signed (Besanko and Thakor (1987b), Bester (1985)). Furthermore it can correct for borrowers' incentives ex post, mitigating the moral hazard problem (Besanko and Thakor (1987a); Bester (1994)). However, the correlation between loan quality and collateral requirements is very dependent on the lending technologies used by banks. Banks in the MENA region mostly follow a traditional business model that limits their ability to screen and gather hard information on loan applicants through transaction lending techniques such as credit scoring, asset-based lending and factoring. Especially when the credit cycle turns rapidly, it would be enormously challenging for loan offices in such banks with low quality hard evidence to predict the prospects of their borrowersBeck et al. (2017). Consequently, banks rely on collateralization to shield them against borrowers' observed and unobserved risk.

However, it is worth noting that banks across emerging economies use relationship lending techniques to compensate for their lack of hard information. In this manner, banks can gain valuable soft information through repeat interactions and by developing a relationship with borrowers. Such proximity between the bank and the borrower has been shown to enable banks to overcome problems of asymmetric

information, allowing them to reach otherwise opaque borrowers Boot (2000). That being said, it is not clear how the use of relationship lending techniques impacts collateral requirements. Boot and Thakor (2000) show that if a bank obtains customer-specific, proprietary information in a long-run lending relationship, it eventually reduces collateral requirements for successful borrowers.

At the same time, relationship lending techniques create a comparative advantage for the relationship lender compared with transactional lenders. The superior information acquired gives relationship lenders an informational advantage that is further strengthened during high financial stress periods, since borrowers have little opportunity to obtain more credit from transactional (less informed) lenders or to start new borrower relationships. Banks eager to increase profits in order to strengthen their capital ratios may be especially willing to enforce higher collateral requirements to exploit higher expected profits. In such cases, borrowers can be locked in the relationship (hold-up hypothesis). Lenders gain an information advantage and ex post bargaining power, enabling them to set and readjust the collateral terms in favor of the creditor. Greenbaum et al. (1989); Sharpe (1990); Rajan (1992); Menkhoff et al. (2006); Sette and Gobbi (2015).

Furthermore, Menkhoff et al. (2006) argues that a housebank, providing special services to its client in terms of liquidity insurance or renegotiation of debt contracts, may demand higher collateral to be compensated for these services since housebanks are normally the first ones to lend and the most flexible towards renegotiating terms with their clients. Moreover, housebanks may need to be secured to a higher extent for taking the risk to enter and develop such long-term relationships with specific borrowers. Menkhoff et al. (2006)

The empirical evidence shows that the evolution of collateral terms according to the lending techniques (relationship vs transaction) is rather rare in emerging economies. Menkhoff et al. (2006) present empirical evidence based on 560 credit files of nine Thai commercial banks during the years 1992-96. Their results illustrate that Thai banks demand additional collateral, ceteris paribus when lenders and borrowers are engaged in housebank relationships.

II.2 Quality of collateral and bankruptcy law in MENA countries

In traditional finance, debt contracts have been evaluated and recognized by their cash flows which constitute fixed promised streams of interest payments. However further studies have recently shown that the rights attached to these contracts are important and defining features of debt contracts (Hart 1995). For instance, debt entitles creditors to repossess collateral when a borrowing company fails to make promised payments. Without these rights or in the absence of their enforcement, investors would not be able to get paid, and it would therefore become harder for firms to raise external finance through debt contracts. For this reason, a creditor secured by the same types and amounts of collateral may fare differently depending on the jurisdiction in which the debt is issued. Collaterals are instruments that make it possible to expand debt contracts to the state of default. However, the effectiveness of theses contracting instruments depends on the transactional cost of executing the contract in the event of default. These transactional costs are related to the institutional quality of countries' judiciaries. The high transactional cost of collateralization in developing countries is a result either of weak legal rules pertaining to investors' rights or of the low quality of their enforcement (Porta et al. (1998)).

The creditor laws in different countries are typically not written from scratch, but transplanted from a few worldwide legal families or traditions (Watson 1974). In general, commercial laws come from two broad traditions: the common law tradition, which is English in origin, and civil law, which derives from Roman law. Within the civil law tradition, there are three major families that modern commercial laws in this tradition originate from: French, German, and Scandinavian. In the area of commercial law, the French and the German civil law traditions, as well as the common law tradition, have gradually spread through emerging countries around the world through a combination of conquest, imperialism, outright borrowing, and more subtle imitation. The resulting laws generally reflect both the influence of the underlying legal family and the revisions specific to individual

countriesPorta et al. (1998). Thus, commercial laws in the MENA region are as a rule based on French civil law traditions and have been revised to comply with Shariah law.

Civil law systems generally give investors weaker legal rights than common law systems, an observation which is independent of the level of per capita income. Common law countries give shareholders and creditors relatively the strongest protections in relative terms. Countries basing their legal systems on French civil law offer the weakest protections, while German-civil-law and Scandinavian-civil-law countries generally fall between the other two groups. The prevailing set creditor laws or what Degryse et al. (2016) calls the "rules in the book" reveal the relative power of secured creditors in bankruptcy proceedings. Porta et al. (1997) and Djankov et al. (2007) construct an index regarding the quality of these "rules in the book" according to four indicators: first, legal restrictions on reorganization ("Reorganization Restrictions"); second, the ability of a creditor to seize collateral once a petition for reorganization is approved ("No Automatic Stay"); third, whether secured creditors are paid first in liquidation ("Secured Creditors First"); and finally, the fourth aspect is whether or not the incumbent management retains control of a firm during reorganization ("Management Doesn't Stay").

Moreover, Porta et al. (1998) observes that the quality of law enforcement is highest in Scandinavian- and German-civil-law jurisdictions, next highest in common-law jurisdictions, and again the lowest in French-civil-law countries. The authors base this observation on the Rule of Law Index, which gives the average of monthly survey-based assessments by investors of the law and order environment in 49 countries between 1982 and 1985. Furthermore, the efficiency of the legal system is also negatively correlated with French-civil-law legal origin when measured by the number of days taken to achieve contract enforcement (Djankov et al. (2003) and Djankov et al. (2007)).

The economies of MENA countries show high transactional costs for secured debt contracts for various reasons. Tunisia, on the one hand, features a relatively highly efficient judicial system while the institutional quality of creditors' right are substantially low. On the other hand, Lebanon, while having exceptionally high

quality collateral laws, suffers from an exceptionally inefficient judicial system measured by contract enforcement days Djankov et al. (2008). The strength of collateral and bankruptcy laws is obsevered in the World Bank's 2013 Doing Business Survey on the basis of an index ranging from 0 to 12, with higher scores indicating that these laws are better designed to facilitate access to credit. The index is itself based on the LLSV index (Porta et al. (1997)), which has more recently been extended by Djankov et al. (2007) to cover a larger set of countries (Djankov (2016)).

Figure II.8 compares the four selected MENA economies[3] with emerging economies in other regions. Figure II.8 indicates that loans are highly collateralized in this region while the quality of collateral and bankruptcy laws are very low even when compared to the laws of developing countries in other regions.

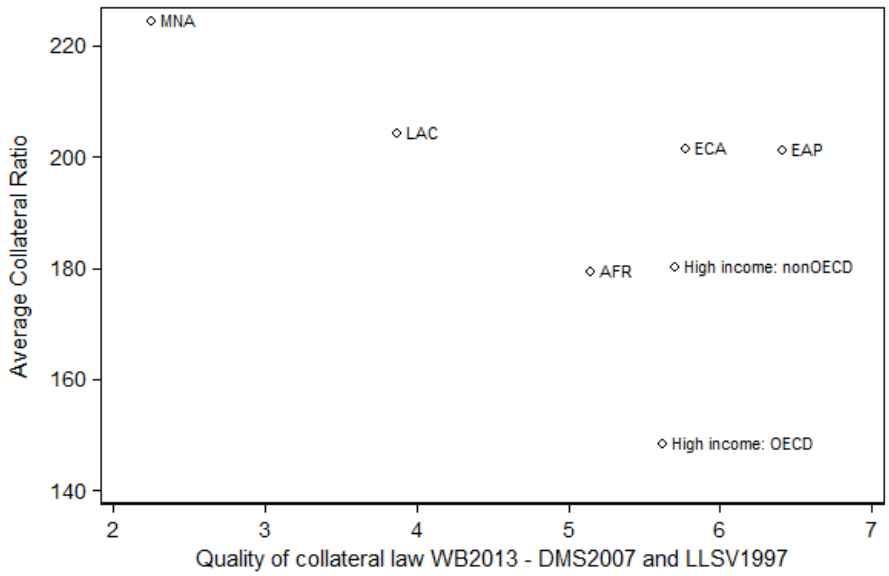


Figure II.8: Collateral Lending and Quality of collateral laws World Bank's 2013 Doing Business Survey

This collateral environment is accompanied by a very unique pattern of financial constraints. Firm-level data in the Middle East and North Africa Enterprise Survey (MENA ES) indicates that firms' financial constraints in the countries surveyed are mostly characterised by low demand and discouraged borrowers. Furthermore, this demand-driven trend of financial constraint is highly biased against young firms, which could inhibit them from meeting their potential for growth and

[3]Egypt, Lebanon, Morocco and Tunisia

job creation.

II.3 Distribution of job creation over firms' life cycles and why it matters

High growth young firms played a critical role in the U.S. economy's robust job growth of the 1980s and 1990s. Over this period, the pace of young firms' dynamic was very high. In the early stages of their life cycle, many of these young firms were not able to grow or even failed, but a small fraction of young firms grew very fast. The high-growth young firms' exceptionally dynamic expansion lead to a disproportionate and sustained average contribution to job creation of the entire cohort of young firms. Moreover, the very variable dynamic of young firms, with high growth among some and high contraction among others, helps to reallocate employment from slow-growing and less productive young firms to more innovative and fast-growing firms. A further contribution to job creation is thus an improvement in the dynamic allocational efficiency of resources toward more productive parts of the economy Decker et al. (2014).

This rich post-entry dynamic of young firms leads to a highly and positively skewed distribution of job creation across firms. Decker et al. (2014) show that young firms have very high skewness. The skewness is seen in the relative magnitudes of the 90th to 10th percentiles of employment growth distribution, where the growth rates of younger firms are much more skewed to the right (positive) compared to more mature firms. This on aggregate accounts for the highly positively skewed distribution of firms' employment growth.

Decker et al. (2014) document that the 90-50 differential for young continuing firms (less than five years old) lies on average around 63 percentage points, 17 points higher than the 50-10 differential. This contrasts with a fairly symmetric growth rate distribution for mature firms, with both a 90-50 differential and a 50-10 differential at 22 percentage points. In other words, growth rates in young firms generate a substantial positive skewness in firms' growth distribution.

Moreover, Decker et al. (2016) report that the contribution of high-growth young

firms to U.S. job creation and the patterns of positive skewness in the firm growth rate distribution are changing. They present evidence that the post-2000 period has seen a decline in young high-growth firms and thus the positive skewness of the firm growth rate distribution has declined dramatically in the post-2000 period. In 1999 the difference between the 90th percentile and 50th percentile in the firm's employment growth rate distribution was 31 percentage points This difference was 16 percent higher than the difference between the 50th and 10th percentile in 1999, reflecting considerable positive skewness. But starting around 2000 this difference exhibited a declining trend. By 2007, the 90-50 differential was only 4 percent larger than the 50-10. The declining trend in skewness continued further through 2011.

These insights on the distribution of contributions to job creation over firms' life cycles could explain the secular slowdown of job creation in post-2000s period. Criscuolo et al. (2014) provide evidence confirming the same pattern of decline in young firms' activities in many European and other developed countries between 2001 and 2011.

With regard to these different bodies of research, it is noteworthy that positive skewness is also very low in the distribution of firms' employment growth in four MENA economies (Egypt, Lebanon, Morocco and Tunisia), based on data from the fiscal year 2012. The difference between the 90th percentile and 50th percentile in firms' employment growth rate distribution was 16 percentage points, only 3 percent higher than the difference between the 50th and 10th percentile. The 90-50 differential for young firms is much higher at 35 percentage points, 25 percent larger than the 50-10 differential. Remarkably, we document that the positive skewness in young firms' employment growth distribution is mostly generated by young firms operating in localities where banks with less stringent collateral policies have a stronger presence. In these localities, the 90-50 differential for young firms is 10 percentage points higher than the average for young firms in localities with less favorable collateral conditions.

II.4 Distribution of employment across sectors and why it matters

For decades, many of the great inventions in product manufacturing of were originally designed to replace human labor. They were either developed to substitute mechanical power for human physical toil or engineered to replace inconsistent human handiwork with machine precision. The very nature and purpose of these inventions has been to replace a suboptimally costly labour force without an initial intention to change, expand or reshape demand. The automation phenomenon is not limited to manufacturing but also affects most fast-growing and innovative service sectors. This implies that in the long run, automation could lead to dynamic inefficiency as it reallocates employment towards the stagnating sectors of the economy. The trend potentially raises serious concerns about the future of employment in advanced economies. However, it seems that a closer look into the data at industry level suggests things might not be completely consistent with this pessimistic view .

Bessen (2016) provides the interesting example of the automated teller machine (ATM) and its impact on bank tellers' jobs. The ATM is sometimes taken as a paradigmatic case of technology substituting workers. And yet, while the ATM took over cash handling tasks, the number of full-time equivalent bank tellers has grown since ATMs were widely deployed during the late 1990s. Indeed, since 2000, the number of full-time equivalent bank tellers has increased 2.0% per annum, substantially faster than the overall labor force. The author points out that the ATM allows banks to operate branch offices at lower cost; its arrival prompted them to open many more branches, offsetting the erstwhile loss in teller jobs. This is a key factor that has sometimes been ignored in the literature on structural change. Although the price mechanism and cost disease suggest that technological change could decrease the demand for labor in more advanced sectors in the medium term, it makes production less costly and more profitable for firms. This gives firms an incentive to invest and expand their capacity, which could partly offset the Baumol effect in the long run.

In the low frequency data of structural change, this translates into a divergence between the pattern of structural change in relation to value added and in relation to the employment share of a given sector in the economy. While technological change can reduce the employment share of a sector, it can leave the value added share intact or even increase it in certain more advanced sectors.

In this third chapter, Fabrizio Coricelli and I document the important change in the pattern of structural change in the post-2000s period. We find that the share of manufacturing in OECD economies has been falling both in terms of value added and of employment. We call this phenomenon of the post-2000s period "Twin Deindustrialization".

Twin deindustrialization could be very costly in long run. By decreasing the value added share of firms, it hampers their incentive and ability to invest, which could further dampen the firms' production capacities and their potential contribution to job creation in the future. Developing a simple model of structural change in an open economy, we indicate that trade exposure to emerging economies could ignite twin deindustrialization in some industries of advanced economies. Our empirical evidence shows that the industries that experience a higher increase in exposure are those that experience the twin deindustrialization phenomena.

Collateral Regimes and Discouragement

1.1 Introduction

The post 2000 period has seen much political turmoil and social upheaval throughout the world that were closely interconnected to economies' failure to create jobs to fight back persistence or occurrence of high unemployment rates. This lead to renewed interest in developing a deeper understanding of why nations fail to create jobs.

One explanation may lie in the fact that the economy fails to optimally allocate necessary resources to those that are contributing the most to the net job creation. Decomposition of job creation has shown that Entrepreneurial Firms that are in early stages of their life cycles play a prominent role in creating jobs in the economy. These young firms reflect business opportunities that have a large enough potential return to be worth taking on the risk of running a new business venture. However, their ability to expand and create jobs crucially depends on the availability of finance to support their business opportunities[4]. Nevertheless, like with any other good quality borrower, information friction tightens their access to external credit. Collateralization has been proven to be an effective lending technique to alleviate the informational inefficiencies by internalizing a firm's risk in its decision to apply for a loan.

[4]Evans and Leighton (1989),Evans and Jovanovic (1989), Blanchflower and Oswald (1998) and Carpenter and Petersen (2002)

This paper argues that the effectiveness of collateral lending closely relates to lower transaction costs faced by banks when taking possession of the collateral in the event of default. When these transaction costs are high, collateral increases the weight of risk to above its optimal level in firms' evaluation of the risk and return to carry out an investment project. This distortion makes the risk-taking behavior of entrepreneurs suboptimally more costly and hampers the incentives for entrepreneurship activities in the economy. In developing countries with lower institutional quality, higher judicial inefficiency and limited law enforcement, collateral lending is subject to high transaction costs. These high costs can discourage new businesses from applying for a loan and could lead to substantial demand-driven missallocation in the credit market against the entrepreneurial firms with high impact in job creation.

Based on this mechanism, the current paper tries to explain the pattern of low job creation rates in four MENA economies[5] (Egypt, Lebanon, Morocco and Tunisia) that all show four specific traits[6]: first, all of these economies feature some of the poorest institutional quality in the world in terms of collateral and bankruptcy laws. Second, the banking systems in these economies are eminently dependent on collateral lending and loans are collateralized at a very high rate. Third, financial frictions are mostly demand-driven and attributed to discouraged borrowers. Fourth, in spite of low job creation rates, the demography of young and highly educated labor force shows high potential for entrepreneurship activity.

Following the entrepreneurship literature that defines entrepreneurial firms by demographic characteristics, I first present stylized facts about the importance of cohorts of young firms in job creation in these four MENA economies[7]. I document

[5] According to (World Bank (2011b)), the region needed to create 6 to 7 million new jobs each year during 2000s to absorb new labour market entrants. However the economies in the region were able to generate only 3.2 million jobs per year during the period, resulting in some of the highest youth unemployment rates in the world (World Bank (2011b)).

[6] See table 1.1

[7] Haltiwanger et al. (2013) and Decker et al. (2014) point out that some data have traditionally contained only information about the size of firms, and thus many studies have considered all small businesses as entrepreneurial firms. However, entrepreneurial activity is better represented by age

that young businesses play an integral role in contributing to net job creation by a holding higher share of total employment and expanding that at a much faster pace than mature firms.

To investigate the effect of collateral lending on job creation, this paper draws on a novel dataset by following the performance of 76 cohorts of firms that entered the market between 1934 and 2009 in four MENA economies during the fiscal year of 2012. This data provides information on the terms of loan contracts, including collateral requirements. Nonetheless, unlike credit registry data, this firm survey data contains information about both borrowing and non-borrowing firms with the latter split up into those constrained by rejection (supply-driven financially constrained), those constrained by discouragement (demand-driven financially constrained) and non-constrained firms.

To guide my empirical investigation, I then build a model of adverse selection with borrowers that are heterogeneous across risk and return dimensions. I deviate from conventional adverse selection models in which the second or first order stochastic dominance assumption boils down the sorting criteria for the quality of borrowers into the risk dimension. In my model, the combination of the Pareto heterogeneity on return and the step distribution on risk leads to the division of firms into two major groups of "low risk-low return" and "high risk-high return" borrowers, in which the latter category represents the entrepreneurial firms. In my framework both groups have the same ratio of good quality borrowers within their population. Unlike the common models of adverse selection, which predict that a missallocation against low risk borrowers is created by ex ante asymmetric information, my model suggests that informational friction could generate missallocation against entrepreneurial firms (high risk borrowers) in the presence of high degrees of collateralization and high transaction costs of realizing collateral in the event of default. The model predicts that in developing countries with lower quality of collateral and bankruptcy laws, less stringent collateral policy could alleviate this missallocation by reallocating the resources toward entrepreneurial firms. Hence

rather than size.

the theoretical framework suggests that young businesses show less discouragement, more access to bank finance, higher propensity to invest and faster expansion when they face with less stringent collateral policy.

To investigate these hypotheses, my empirical analysis faces two main methodological challenges. The first issue is reverse causality. It is not clear whether higher collateral requirements lead firms to have lower performance or whether banks require more collateral from low performance firms. This prevents us from drawing a causal connection between banks' collateral policy and firms' performances. Second, according to the model, collateral policy impacts firms' performance by discouraging them to apply for a loan. Moreover, the descriptive statistics suggest that discouragement is a main driver of financial friction in these four economies. However, the collateral requirements associated with a loan are only defined for firms that currently have a loan outstanding. Thus I do not directly observe the link between collateral requirements and the performance of discouraged borrowers.

To address these challenges, this paper adopts a two-stage procedure[8] . The first stage recovers each bank's collateral policy. The collateral policy of an individual bank is defined as the average conditional collateral requirement for all clients of that bank. It can be recovered through a regression of the required ratio of collateral to loan value on borrower characteristics and a bank-specific fixed effect. In a second stage, we link these bank specific collateral policies to firms through *Local Banking Methodology*[9]. In this approach the estimated collateral policies are aggregated into a collateral index, reflecting market practices in the area where the firm is located. To this end I exploit location data to identify all bank branches that are located in a circle with a radius of 10km centered on each firm in the sample. By averaging the estimated collateral policies of all banks with branches in the circle I construct the collateral index that represent the collateral practices in the vicinity of the firm. This collateral index is then used to explain firms' performances.

[8]See Betz and Ravasan (2016)

[9]See Beck et al. (2017)

I found that firms grow faster when they face less stringent local collateral policy, while this positive effect is significant only for young businesses. The results also indicate that these entrepreneurial businesses are more likely to invest when they are located in areas where banks with less stringent collateral policies have a stronger presence. The empirical results also shed light on the effect of the prevailing collateral regime on firms' financial choices. Less stringent local collateral policies lead young firms to get less discouraged from applying for a loan and to have more access to bank finance.

Although in my primary empirical results, I assume that young firms represent entrepreneurial firms, there is a significant degree of heterogeneity among new businesses and not all of them pursue the risk-taking/opportunity-seeking behavior that is at the heart of entrepreneurship definitions (Knight (1921)). There are many new enterprises that enter the market out of necessity. They do not aspire any growth and thus they do not intend to take risks or make any substantial investments[10]. These necessity-oriented young businesses do not fit the high-risk high-return structure of entrepreneurial firms .
Within firms' properties, the characteristics of entrepreneurs such as their educational background could help to narrow down the definition of entrepreneurial firms. A sample split analysis shows that the results get stronger on a subsample of firms whose managers have a university degree.

This paper offers a new theory that collateral requirements could lead to missallocation against entrepreneurial businesses by suboptimally discouraging risk-taking behavior in the economy. Alternatively, Financial friction through "collateral constraint" could also raise aggregate inefficiency [11] and this aggregate inefficiency could be biased against new businesses, as they have fewer assets to pledge as collateral. This theory predicts that the collateral constraint channel should be more severe among firms with fewer assets on their balance sheets. Splitting firms according to whether they have more assets than the country's median level, I try to

[10]See Block and Sandner (2009) , Schoar (2010) , Hurst and Pugsley (2011) and Poschke (2013)

[11]See Bernanke and Gertler (1989) , Kiyotaki and Moore (1997) , Buera et al. (2011),Calvo et al. (2012) , Chaney et al. (2015)

examine these two competing theories. I find that my results stem from the sub-sample of firms with more assets (which also includes higher rate of good quality firms compared with the other group).

Contribution to the literature

This paper contributes to several strands of the literature. Our conceptual framework contributes to the literature on missallocation of credit, attributing it to ex ante asymmetric information. While the literature's consensus considers the borrowers' tendency toward risk taking, which is suboptimal in the presence of informational friction, this paper shows that a missallocation due to the ex ante informational gap could also arise due to a lack of risk-taking behavior.

The paper also contributes to the previous literature of optimal debt contract that suggests that collateral may not always be optimal within the ex ante private information framework[12]. However, in those models there is an interaction between ex ante and ex post information asymmetry. Here, we demonstrate that even in the absence of an ex post informational gap, there is a threshold $\mathscr{D}^*$ above which the degree of collateralization impairs informational efficiency.

Moreover, it contributes to the studies that investigate the relationship between collateral and credit risk. Adverse selection models predict that low risk borrowers benefit more from pledging collateral while some empirical observation indicates that riskier borrowers are more likely to pledge collateral [13]. Berger and Udell (1990) points out that the inconsistency arises out of the difference between the observable and unobservable parts of the borrower's risk, while most of the adverse selection models concentrate only on the unobserved part of the risk. My model indicates that higher collateral rates benefit those that have lower "unobservable risk" more, whereas lower collateral rates will favor those that have lower "observable risk". Eventually my theoretical framework could contribute to the financial and legal institutions' development[14] by looking at the transaction costs arising from the low quality of collateral and bankruptcy laws.[15] .

[12] See Carlier and Renou (2005, 2006)
[13] See Berger et al. (2011) and their references
[14] Porta et al. (1998)
[15] Barro (1976) andJappelli et al. (2005)

The literature on job decomposition among firms highlights the role of entrepreneurial firms. However the empirical evidence is still thin for developing countries. This paper documents the importance of young businesses in four MENA economies. Furthermore, it suggests that the role of entrepreneurial firms might be even more crucial in developing countries as they hold higher share of employment due to the lack of expansion in mature firms. Unlike developed countries, firms do not show significant dynamics once they are mature [16].

Although long-standing theoretical foundations for demand-driven financial friction due to discouragement exist, there is a young and recent line of research that has begun to empirically investigate its importance and impacts on firms' performances[17]. In line with Popov and Udell (2010), I document that credit constraints more frequently take the form of discouragement than rejected loan applications. Furthermore, I empirically investigate how the pattern of discouragement interacts with collateral requirements. Finally, this paper contributes to the literature that investigates the effect of collateral lending on entrepreneurial firms. While existing studies concentrate on the effect of binding collateral constraints on these firms, this paper offers a new channel that suggests collateral policies could hinder young businesses by making the risk taking behavior more costly and hindering the entrepreneurship activities among these young businesses.

The remainder of the paper proceeds as follows. Section 2 outlines the link between job creation, entrepreneurship and discouragement. Section 3 presents stylized facts on firms in MENA economies.Section 4 develops the adverse selection model with heterogeneous borrowers across risk and return. Section 6 presents the results and discusses the estimations. Section 7 concludes.

[16] Hsieh and Klenow (2009)

[17] See Cole (2008) Berkowitz and White (2004) and Berger et al. (2011) for the United States, Brown et al. (2011) and Popov and Udell (2010) for Europe, and Chakravarty and Xiang (2013) for developing countries.

1.2 Job Creation , Entrepreneurship and Discouragement

The greater availability of firm level data in different countries shows that there exists astounding disparity in firms' contributions to the job creation in the economy. First attempts to decompose the job creation across the distribution of firms goes back to the seminal works of David Birch (Birch (1979), Birch (1987) and Birch and Medoff (1994)) that showed that a small percentage of high impact firms generate a large share of net new jobs. Looking at the distribution of firms, most of them don't show any dynamics (they neither significantly expand nor contract) which makes the distribution of net employment growth extremely dense around its median at zero. The thin upper tail of this distribution entails high impact firms that account for a substantially large share of net job creation.These high impact firms are disproportionally young. (Henrekson and Johansson (2010) [18] ,Haltiwanger et al. (2013), Decker et al. (2014) and Decker et al. (2016)).

The job-creating prowess of young businesses stems from firms' rich dynamics and their ability to expand at a much higher pace at the early stages of their life cycle, due to entrepreneurship activities. Entrepreneurship and the inverse relationship between age and employment growth[19] have a long-standing theoretical grounding in "Learning Theory", which shed light on the dynamics and evolution of firms during their early lives (Jovanovic (1982) , Lippman and Rumelt (1982) , Evans (1987) , Pakes and Ericson (1998)[20] and Acs and Mueller (2008)[21]).
Learning Theory points out that there is a gap between the stock of *knowledge* and *know-how* in the economy (Arrow (1962), Mansfield (1974), Teece (1977), Romer

[18] Henrekson and Johansson (2010) summaries the findings and results for 20 studies on 10 countries (Canada, France, Finland, Germany, Italy, the Netherlands, the U.K., the U.S.A., Spain and Sweden) from the 1990s on. They point out that all studies find high impact firms to generate a large share or all net jobs. All studies that report on age confirm that high impact firms tend to be younger.

[19] Throughout this paper the inverse relationship between age and employment growth (if left unexplained) refers to the negative correlation between age and employment growth that persists after controlling for the inverse relationship between size and employment growth

[20] for Jovanovic model with active learning

[21] for Learning Theory in business studies)

(1990) and Acs et al. (2009)). An entrepreneur creates a business opportunity by filling part of this gap and transforming some knowledge into new know-how. The information on this new know-how is subject to incompleteness and asymmetry across the economy Acs et al. (2009). Incompleteness of information exposes the entrepreneur to the risk of possible failure in the future. However, asymmetric information on this new know-how (which implies that there are just a few firms that have access to this know-how) creates a local monopoly that enhances the entrepreneur's return and potential to expand and create jobs (Glaeser et al. (1992)). As a firm grows older and passes through its learning phase, it accumulates more information on its know-how that reduces the information incompleteness and hence the risk. Concurrently, the information on the new know-how defuses across the economy and trims the firm's profits and thus its capability to continue expanding.

Learning Theory illustrates two important facets of entrepreneurship: "High Risk" and "High Return". While running a new enterprise based on a viable business opportunity raises the risk of failure for firms in early stages of their life cycle, it also boosts the young firms' growth potential and ability to create jobs if business ventures succeed. Data shows that most of these new businesses fail. They either contract, or do not grow and remain small. However, a small fraction of young firms that succeed exhibit very high growth and contribute substantially to job creation. These high-growth firms make up for nearly all the job losses associated with shrinking and exiting firms within their cohort. The implication is that each young cohort of firms on average shows substantial expansion overall and makes a long-lasting contribution to net job creation Decker et al. (2014).

Nevertheless, the job-creating potential of these young firms highly depends on their access to finance while, like any other good quality borrowers, information friction could dispose them to credit rationing. (Jaffee and Russell (1976)) . Banks use credit rationing to reduce the cost of ex ante informational asymmetry. Credit rationing could happen through supply à la Stiglitz and Weiss (1981) or through demand. Banks could use contractual instruments such as collateral to ration bor-

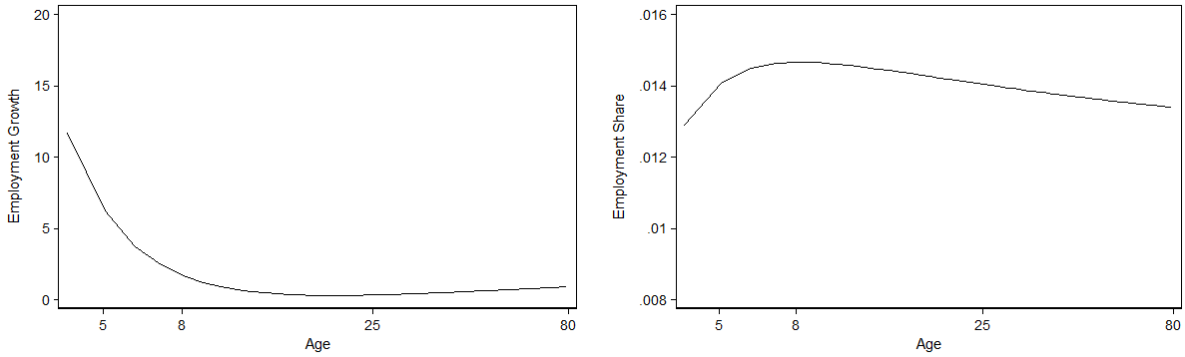
rowers through demand. (Bester (1985); Chan and Kanatas (1985) andBesanko and Thakor (1987a,b)). Using collateral in debt contracts, banks could indirectly ration a part of the bad quality borrowers by discouraging them to apply through what Salop and Salop (1976) call the "self-selection" mechanism. Collateral shifts part of the risk back to the borrowers and internalizes the risk of default in firms' decisions to apply for a loan. However, the effectiveness of collateral lending in the alleviation of informational asymmetry is closely related to the transaction costs that banks face to get possession of collateral in the event of default. When transaction costs are high due to the low quality of collateral and bankruptcy laws, collateral lending could lead good quality borrowers to self-select themselves out of the credit market. This demand-driven financial friction out of discouragement is biased against new businesses that naturally face higher risks.

1.3 Firms in MENA Economies: Stylized Facts

In this section, following the performances of 76 cohorts of firms that entered the market between 1934 amd 2009 in four MENA economies (Egypt, Lebanon, Morocco and Tunisia) during the fiscal year of 2012, I present some of the important stylized facts on job creation, firms' dynamics and investment behavior as well as discouragement and access to finance.

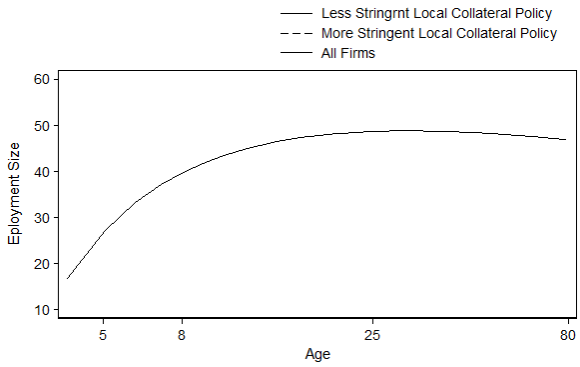
Figure 1.9-(a) indicates the employment growth across different cohorts of firms. It captures the unconditional [22] inverse exponential relation between age and employment growth.

[22] Not controlled for size-employment growth relation

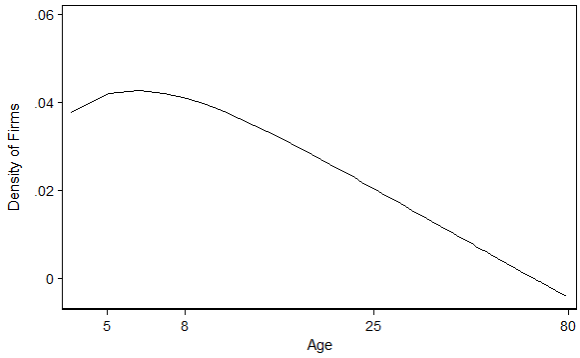


(a) Employment Growth

(b) Employment Share



(c) Firms' Size



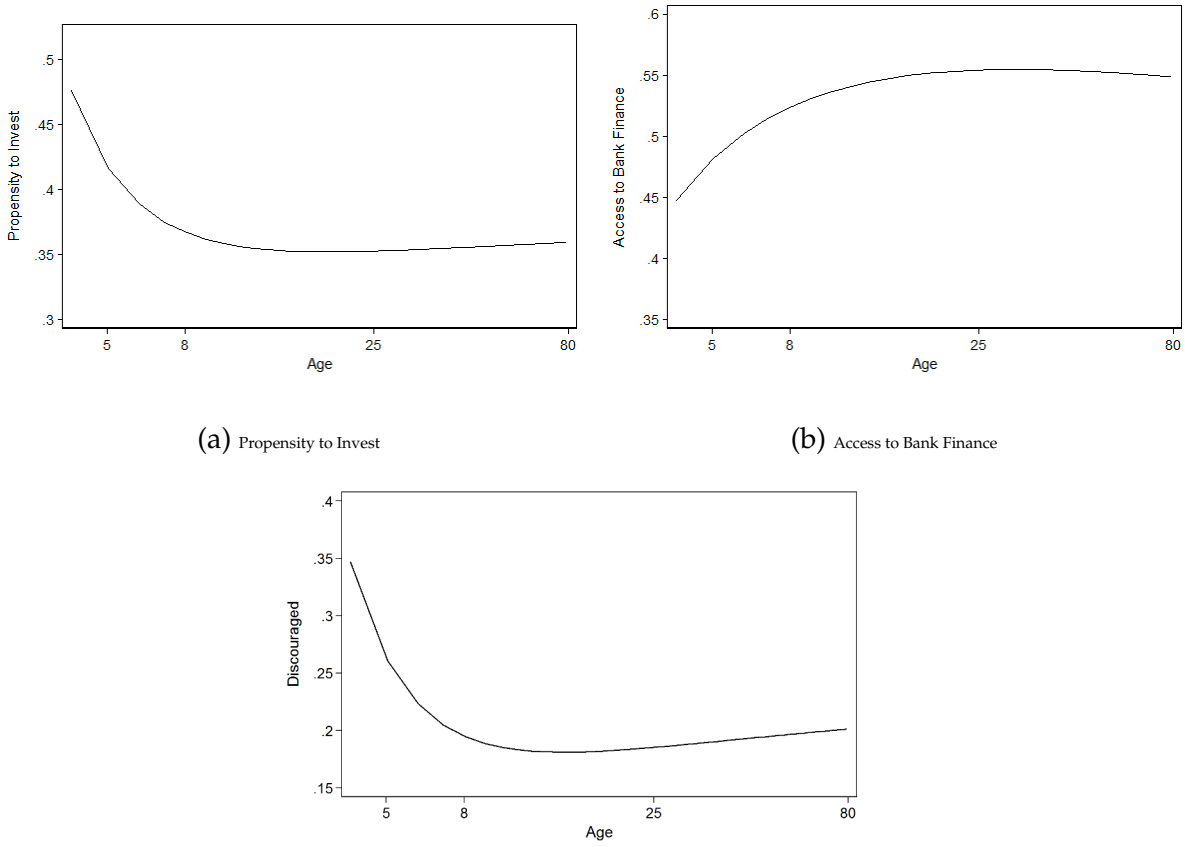
(d) Firms' Density

Figure 1.9

It indicates that on average, firms in early stages of their life cycle tend to expand at a much higher rate. This fast expansion diminishes rapidly once firms grow more than 8 years old. Many studies consider 5 or 8 years as the threshold to classify the young and fast growing firms; this seems also to hold in my sample of data. Figure 1.9-(b) depicts the share of each cohort of firms from total employment in the economy. Although young firms are smaller initially, they swiftly catch up with mature firms in terms of employment share. Figure 1.9-(b) illustrates that the cohorts of firms around 8 years old hold the highest share of employment. This pattern is different from the distribution of jobs across firms in developed countries, where older firms have a higher share of existing jobs Haltiwanger et al. (2013). This pattern arises due to the higher density of younger cohorts (1.9-(d)) as well as weak expansion and lack of dynamic among mature firms (1.9-(c)). The latter is in line with the findings of Hsieh and Klenow (2009) for India, China and Mexico. owing to the fact that younger cohorts have a higher share of existing job and that they

expand it more rapidly, young firms and their growth potential might play even more crucial role in job creation in developing countries.

The job-creating prowess of young firms and their rapid expansion could potentially be explained by the entrepreneurship activities in the early stages of a firm's life cycle. However, if entrepreneurship is truly a main driver of the inverse relationship between age and employment growth then we should observe a similar pattern in firms' investment behavior. In other words, we should observe higher tendency for investment in the early stages of a firm's life cycles.



(a) Propensity to Invest

(b) Access to Bank Finance

(c) Propensity to get Discouraged

Figure 1.10: Investment Behavior , Access to Finance

Figure 1.14-(a) indicates that younger firms are more prone to invest in fixed assets. Nonetheless, in spite of higher investment propensity among young firms, they are less likely to have access to bank credit to receive finance for their investment as has been shown in Figure 1.14-(b). The lower access to external finance could stem from demand-driven financial constraints as the share of the firms

that get discouraged from applying for a loan is substantially higher among young firms. Figure 1.14-(c) indicates this negative exponential relationship between age and discouragement.

1.3.1 The Model

In this section I develop a stylized model to depict how collateral lending could raise allocational inefficiency in credit market through its impact on demand for external finance when economy populated by entrepreneurs that carrying out investment plans with heterogeneous risk-return structures .
I begin by setting up a multi period environment with infinite horizon , continuum of heterogeneous enterprises and the bank which supplies external finance through collateral lending.
First I define financial contract in my environment.Then I find partial demand (participation condition for borrower) and supply (participation condition for lender) at period $t+1$ taking the distribution of applicants in period t as given. Then I solve for stationary equilibrium which gives us the steady state on demand , supply and an stationary distribution on pool of applicants.

1.3.2 Financial Contract

Financial Contract is agreed and concluded within two periods. I assume borrowing and lending take place at the first period while project realization and settling up by lenders and borrowers occurs in the second period a la Bernanke and Gertler (1990)

During the first period. , lender offers the borrower a contract in form of (R , ζ). R is the interest rate for each unit of credit and ζ is the rate for collateral requirement(percentage of the one unit of credit that is secured by borrower's collateral). In an event of the success , borrowers pay back the interest rate . otherwise, they default and the bank keeps the collateral with the interest borne by it. Thus R and ζ defines the arrangement of borrower and lender for each state of project's outcome.I assume lending and borrowing happens under ex ante asymmetric information, in which the bank is not able to distinguish the risk return structure of current appli-

cants . Therefore bank sets the contract term according to its set of information that stem from the realized outcome for pool of applicants in the last period. Bank has adaptive expectations and updates its expectation by setting

$$\mathbb{E}(\bar{\theta}_{t+1}) = \bar{\theta}_t \tag{1.1}$$

Furthermore as borrowers' types cannot be observed individually through realized returns, bank's information is limited to average risk of borrowers.

1.3.3 Bank's supply for external finance

First, I look at supply side where banks are lenders with inelastic supply. They finance their required funds at the risk free interest rate r in a deposit market. Furthermore they face pool of applicants, including firms that are heterogeneous in terms of the risk and return of of the their investment projects. θ_i denotes the risk for firm i. It indicates that with probability of θ_i the investment project of borrowers going to succeed and with probability $1-\theta$ its investment will fail. Bank could not distinguish among different types of applicants therefore it makes its decision on the risk of investment plan and terms of the contract based on its realized average risk from pool of applicants in the last period.

$$\Pi^{B}_{t+1} = [\bar{\theta}_t R_{t+1} + (1-\bar{\theta}_t)(1+r)\zeta(1-\eta) - (1+r)] \tag{1.2}$$

$\zeta(1-\eta)\ \epsilon\ [0,1]$ is the "Effective collateral rate" adjusted by interest rate. Following Barro (1976) Chan and Kanatas (1985) and Jappelli et al. (2005) , we assume there is a disparity between collateral valuation by the borrowers and the bank. This disparity are related to the transactions costs, the bank faces in taking possession of and liquidate the collaterals in an event of default. We denote this transaction cost by $\eta\epsilon[0,1]$. The transactions costs reflects institutional quality [23]. In my context they indicate the quality of collateral and bankruptcy laws in each country.

Considering banks as competitive risk neutral lenders, the rationing interest rate R in credit market is determined by setting the expected profit equal to zero. Hence For given rate of collateral requirement, the inelastic supply of credit will be defined

[23] Coase (1960) and North (1992)

by interest rate R as following

$$R_{t+1} = \frac{(1+r)}{\bar{\theta}_t}[1 - \zeta(1-\eta)(1-\bar{\theta}_t)] \tag{1.3}$$

It worth to note that, the higher expected average risk of applicants increases the interest rate spreed. However higher collateral rate covers part of this risk that bank faces and thus it reduces the cost of bank's finance. Nonetheless, the higher transaction cost η , diminishes the effectiveness of collateral. Thus the lower expected recovery rate $1-\eta$, increase the interest rate spreed and tightens the credit supply which in line with empirical evidences such as (Djankov et al. (2007) and BAE and Goyal (2009))

1.3.4 Firms' demand for external finance

In my framework,economy populated by risk neutral firms that decide to carry out a fixed investment through external finance by considering the return and risk to their investment project as well as the cost of external credit. With probability of θ their investment project will be successful and it returns A for each unit of capital. Successful firms then return rate R to the banks in second period. With probability of $1-\theta$, their investment fails with zero return . Hence they default on their loan and the bank seizes their collaterals . Therefor Firm i expected return from investing one unit of external credit could be written as following: period.

$$\Pi^F_{i\ t+1} = \theta_i(A_i - R_{t+1}) - (1-\theta_i)(1+r)\zeta$$

Firm i which carrying out the project with return A_i with probability of θ_i decides to apply for a bank loan if $\Pi^F_{i\ t+1} \geq 0$ Therefore we could write down the elastic demand which denotes the participation condition for firm i as following

$$A_i \succeq \frac{\theta_i R_{t+1} + (1-\theta_i)(1+r)\zeta}{\theta_i}$$

The collateral rate has two effects on demand of firm i. First, the direct effect that discourages firm to apply for external fund as it reallocate some of the risk involved in the investment from the bank toward the firm. Then there is a indirect effect through the interest rate R. The higher collateral rate reduce the interest rate spread

which increase firm's incentive to apply. By replacing R from first stage we could see the outcome of these two opposite effects.

$$A_i \succeq (1+r)[\frac{1}{\bar{\theta}_t} - \zeta(\frac{1}{\bar{\theta}} - \frac{1}{\theta_i}) + \eta\zeta\frac{1}{\bar{\theta}_t}] \tag{1.4}$$

"Application Condition" 1.4 reads a key points in interaction of collateral with borrower's demand for external finance. When there is no collateral requirement $\zeta = 0$ the information asymmetry leads to typical adverse selection inefficiency as competitive interest rate subsidize the high risk firms (entrepreneurs that their probability of success is lower than average $\theta_i \leq \bar{\theta}$) and punishing the low risk firms (borrowers that their probability of success is lower than average $\theta_i \geq \bar{\theta}$).
When there is no transaction costs between firm's and bank's evaluation of collateral, $\eta = 0$, collateral works perfectly to clear out the information inefficiency by optimally increase the incentive to apply for a loan for all low risk types and optimally discourage the high risk borrowers. When $\eta = 0$ we could rewrite the 1.4 as following

$$A_i \succeq \underbrace{\overbrace{\frac{(1+r)}{\theta_i}}^{\textit{Internal Finance}} \quad \overbrace{[\frac{\theta_i}{\bar{\theta}_t} - \zeta(\frac{\theta_i}{\bar{\theta}_t} - 1)]}^{\textit{External Finance Spread}}}_{\textit{Opportunity Cost of Investment}} \tag{1.5}$$

Application condition 1.5 illustrates that for all firms with any vector of risk return A_i, θ_i the higher collateral rate strictly reduce the wedge between cost of internal and external finance. When loan is fully secured $\zeta = 1$, collateral entirely takes out the informational friction and the cost wedge of external finance throughly disappears. When there is a transaction cost for the bank to seize the collateral in case of default, $\eta > 0$, the effective collateral then is $\zeta(1-\eta)$.
"Application Condition" 1.6 indicates the effective part of Collateral $\zeta(1-\eta)$ continues to reduce the information friction between the bank and the borrower for all types of firms with any risk-return structures. Nevertheless, the deadweight part of collateral creates a excess burden for borrowers as it raises the cost of external finance. This deadweight loss has also allocational effect against high risk borrowers

since the excess burden sores when the risk of investment plan is higher.

$$A_i \succeq \underbrace{\overbrace{\frac{(1+r)}{\theta_i}}^{\text{Internal Finance}} \quad [\frac{\theta_i}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{\theta_i}{\bar{\theta}_t} - 1) + \overbrace{\zeta\eta(1-\theta_i)}^{\text{Deadweight Loss}}]}_{\text{Opportunity Cost of Investment}} \overbrace{\qquad\qquad}^{\text{External Finance Spread}} \tag{1.6}$$

Application condition 1.6 illustrates that not only the fully secured loans ($\zeta(1-\eta) = 1$) could not restore the efficiency on credit market any more but also they create missallocation against high risk high return borrowers.

To delve into the allocational effect of collateral we need to find the pattern of applicants and discouraged borrowers at stationary equilibrium. To do so, first we lay out set of assumptions on distribution of firms with heterogeneous risk and return. We then solve for the applicants' stationary joint distribution of risk and return.

1.3.5 The Risk Return Structure of firms

In my framework, there is a Pareto heterogeneity on return and the step distribution on risk. This distributional pattern divide firms into two major groups of "low risk-low return" and "high risk-high return" borrowers in which the latter category represents the entrepreneurial firms. The first group is mean preserving the second group and both have the same ratio of good quality borrowers within their population.

I assume in my economy, the firms are either of type L ("Low risk") or H ("High risk"). The return of firms within each type $i\epsilon\{L, H\}$ follows a Pareto distribution $G(A) = 1 - (\frac{A}{\underline{A}^i})^{-\alpha}$ for all $A\epsilon[\underline{A}^i, \infty]$ .Furthermore, firms of each type are uniformly distributed over the intervals with the length λ_i $i\epsilon L, H$ where $\lambda_L + \lambda_H = 1$. The pool of applicants include all firms from both types that their return is higher than their opportunity cost of one unit of investment by external finance. Imposing the application condition (1.6) on joint distribution of risk and return , I could find the average risk of firms in pool of applicants as following

$$\bar{\theta}_{t+1} = \lambda_L\theta_L\frac{\Gamma(\theta_L, \bar{\theta}_t)}{\Gamma(\theta_L, \bar{\theta}_t) + \Gamma(\theta_H, \bar{\theta}_t)} + \lambda_H\theta_H\frac{\Gamma(\theta_H, \bar{\theta}_t)}{\Gamma(\theta_L, \bar{\theta}_t) + \Gamma(\theta_H, \bar{\theta}_t)} \tag{1.7}$$

$\Gamma(\theta_i, \bar{\theta}_t)$ denotes the share of firms with type $i\epsilon\{L, H\}$ that decide to apply as their risk and return satisfies application condition (1.6)

$$\Gamma(\theta_i, \bar{\theta}_t) = \int_{\frac{(1+r)}{\theta_i}[\frac{\theta_i}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{\theta_i}{\bar{\theta}_t} - 1) + \eta\zeta(1-\theta_i)]}^{\infty} dG(A) \tag{1.8}$$

In my framework, the credit rationing happens entirely on demand side through self selection and discouragement. Discouragement raises inefficiency when good quality borrowers decide not to apply. My definition of good borrowers differ from those commonly used in adverse selection literature. The first or second order stochastic dominance assumptions that widely used in previous works, boils down the criteria for sorting the quality of borrowers into risk dimension. However,in this paper, the quality of borrowers defined by the efficiency of their investment plan. Good quality borrower is the firm that carrying out an investment that its expected return exceeds its opportunity cost (depositing at risk free rate r). Hence quality of borrowers is defined both on risk and return dimensions and low and high risk types both include set of good quality borrowers. The following definition gives the criteria for good quality borrower that is used throughout this paper.

Definition: *Good Quality firm* :

Firm j with risk return vector of $\{A_i, \theta_i\}$ is of "Good Quality" with an efficient investment if and only if its risk return satisfies the application condition when there is no spreed between internal and external finance as following

$$A_i \succeq \frac{(1+r)}{\theta_i} \tag{1.9}$$

"Efficiency Condition" 1.9 also implies that good quality firm execute this investment plan by internal finance if it is available.

We assume that $\underline{A}^L\theta_L = \underline{A}^H\theta_H$. This condition assures the ratio of "Good Quality" firms in two types are equal. Moreover,

We assume the shape parameter α is close to one. In this case the high risk borrowers do not have the strong first order stochastic dominance over the low risk borrowers. And eventually for sake of simplicity we assume the mass of low risk and high risk borrowers are equal. These set of assumptions underpin the efficient average risk of applicants θ^* at arithmetic mean of two type's risk level, Θ

$$\theta^* = \Theta = \frac{\theta_L + \theta_H}{2} \tag{1.10}$$

where the share of each type is equal from pool of applicants.

1.3.6 The allocational effect of collateral

Having outlined the model and characterized its set of assumptions in the previous section, we now move on to find stationary distribution of applicants , discouraged borrowers and related comparative statics. Our main interest is in investigating the allocational effect of collateral and how it improves(impairs) the allocational efficiency.

Solving equation (1.7) , we could find the deviation of average risk of applicants from efficient level at stationary equilibrium (when $\bar{\theta}_{t+1} = \bar{\theta}_t$)

$$\frac{\bar{\theta}(\zeta, x) - \theta^*}{\theta^*} = \Delta(\zeta, x) = \mathscr{B}(\zeta, x)(1 - \zeta(1 - \eta) - \zeta\eta\Theta) \tag{1.11}$$

$$\mathscr{B}(\zeta, x) = \frac{-x^2}{1 + \zeta\eta[1 - \Theta(1 + x^2)]} \preceq 0$$

Proof. in Appendix II.a □

x denotes the half distance between the high and low risk as a percentage of average risk of all firms. $x = \frac{\frac{\theta_H - \theta_L}{2}}{\Theta}$. x indicates bank's screening error and captures the intensity of uncertainty that banks face. The following four propositions present the key facts about equation .

Proposition 1. *Average risk of applicants is decreasing in collateral rate ζ($\bar{\theta}(\zeta, x)$ is increasing in collateral rate ζ).*

Proof. in Appendix II.b □

Proposition 1 points out that more stringent collateral policy reallocate the credit from high risk to low risk borrowers by discouraging high risk borrower to apply for a loan.

Proposition 2. *Bank's screening error x exacerbates the deviation from efficient allocation as $\Delta(\zeta, x)$ is decreasing in x when $\Delta(\zeta, x) \prec 0$ and $\Delta(\zeta, x)$ is increasing in x when $\Delta(\zeta, x) \succ 0$.*

Proposition 2 stress the fact that informational asymmetry drives the allocational inefficiency. When the informational gap is insignificant the allocation inefficiency disappears.

Definition: *Degree of collateralization and Collateral Policy* :

$\mathscr{D} = \zeta(1 - \eta)$, indicates degree of collateralization with support $[0, 1]$. $\mathscr{D} = 0$ indicates bank lending through unsecured loans while $\mathscr{D} = 1$ defines bank supply credit under fully secured loans. Higher degree of collateralization means bank has more stringent collateral policy.

Proposition 3. *Optimal Collateral Policy : Optimal Degree of collateralization that could restore the allocational efficiency is given by*

$$\mathscr{D}^* = \frac{1}{1 + \frac{\eta}{1-\eta}\Theta} \tag{1.12}$$

In presence of higher transaction cost for collateral η , the optimal collateral policy suggests that the lower degree of collateralization must be implemented.

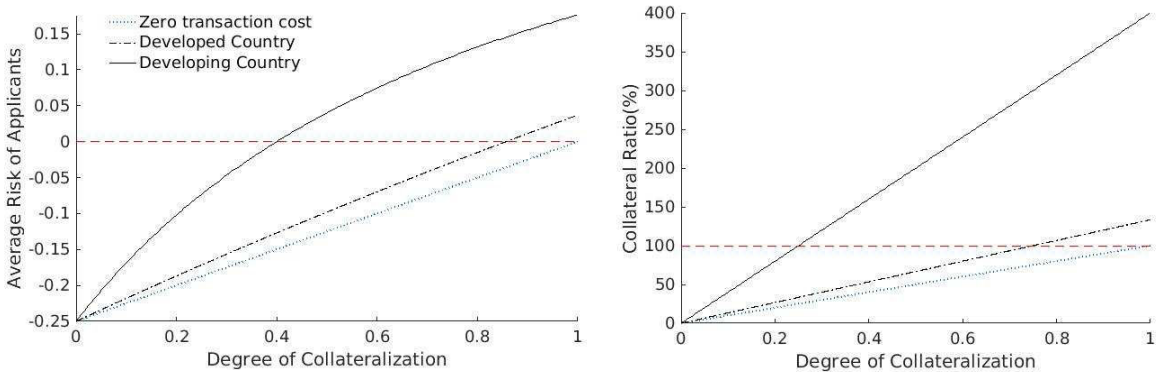
When there is no transaction cost on collateral, higher degree of collateralization is strictly efficiency improving.In this instance, fully secured loans $\zeta = 1$ completely remove the informational inefficiency and restore the efficiency. However in presence of non zero transaction cost, for all $\mathscr{D} \succ \mathscr{D}^*$, higher rate of collateralization strictly impairs the efficiency.

Proposition 4. *Discouraged borrowers : For all $\mathscr{D}$ lower than optimal level $\mathscr{D} \epsilon [0, \mathscr{D}^*]$, information friction raise allocational inefficiency against low risk borrowers as low risk good quality borrowers are more likely to get discouraged.*
For all $\mathscr{D}$ higher than optimal level $\mathscr{D} \epsilon [\mathscr{D}^*, 1]$ information friction raise allocational inefficiency against high risk borrowers as high risk good quality borrowers are more likely to get discouraged.

1.3.7 Implication of the model

Effectiveness of Collateral and Quality of institutions

The four propositions that have been outlined in previous subsection suggest that in presence of transaction costs, the aggressive collateralization could raise allocational inefficiency against entrepreneurial firms (high risk borrowers) by discouraging them to apply for a loan .In developing country with lower institutional quality , higher judicial inefficiency and limited law enforcement , banks face more barriers to liquidate the collaterals and thus collateral lending is subject to higher transaction cost . This implies that miscalculation against young firms through discouragement is more likely and more severe in developing countries .Figure 1.11-(a) visualize this comparison between developed and developing countries. [24]



(a) Allocational Inefficiency

(b) Collateral Ratio

Figure 1.11

My four propositions summaries the prediction of the model and hypothesize that the less stringent collateral policy , the less likely it is that the young businesses get discourage to apply for a loan. Thus they have more access to bank finance and they invest more. The latter enhance the employment growth of young businesses and lead them to grow faster.

Figure 1.11-(b) indicates when the transaction cost is higher. the same degree of collateralization would realize at higher collateral ratio. Therefore the same collat-

[24]To implement this numerical example we set transaction cost, η respectively to 25% and 75% for developed and developing countries. We also assume the observed risk of borrowers, Θ is equal to 50%. The results hold for all set of parameters and do not depend how we discipline them.

eral ratio in different country does not imply the same collateral policy. Thus my estimates should be limited to exploit the variation in collateral practices within a country by a given institutional framework.

Collateral and Composition of Risk

These four propositions also shed lights on an important side prediction of the model which is highlighted before by Berger and Udell (1990). Each firm's risk θ has two parts observable , Θ, and non observable, $\theta - \Theta$. Proposition 1 suggests higher collateral rate benefits firms with lower "unobservable risk". However Proposition 3 implies lower collateral rate favors the firms that have lower "observed risk".Berger and Udell (1990) have pointed out that in the literature most of studies finding that is safer borrowers are more likely to pledge collateral(Chan and Kanatas (1985)). However, this view is not generally consistent with conventional wisdom in banking which holds that riskier borrowers are more likely to pledge collateral (Morsman (1996)). An essential difference between most of the theoretical models and conventional wisdom is that the former usually concentrate on private information about risk known only to borrowers, while the latter concentrates on observed risk. It is worth to note the negative association between optimal collateral rate and observed risk magnifies when disparity is larger.

1.4 Data

1.4.1 The MENA Enterprise Survey

Our data comes from The Middle East and North Africa Enterprise Survey (MENA ES), funded jointly by EBRD, EIB and the World Bank. The MENA ES provides the firm level data of the formal private sectors in our sample of four MENA economies: Egypt, Lebanon, Morocco and Tunisia . The survey covers manufacturing and service firms with at least five employees, where services includes retail, wholesale, hospitality, repairs, construction, transport and information technology (IT) sectors. However sectors such as agriculture, fishing, and extractive industries, as well as utilities has been not covered in the survey. Also some of services sectors such as

financial services, education, and healthcare has been not included in the survey.

The MENA ES addresses a broad range of business environment issues such as access to finance, The organization and quality of firms, managers characteristics , market structure and the political instability that firm faces, as well as their performance measures. The samples are stratified by firm size, sector of activity, and location within these four economies. The survey covers 6083 firms in total with sample size ranging from 407 firms in Morocco to 2897 in Egypt. The MENA ES follows the World Bank's global methodology for enterprise surveys. The data are therefore comparable with enterprise surveys in 126 countries covering more than 94,000 firms. EBRD et al. (2016) presents first results of the MENA ES. Data collection took place in the aftermath of the Arab Spring. Respondents were interviewed in 2013 and 2014, but the reference period of the survey is firms' fiscal year 2012.

1.4.2 Firm's Performances and Characteristics

Firms' performance in terms of job creation is our variable of interest that we seek to explain. We compute employment growth through expansion for all incumbent firms comparing the number of their full time employees at the end of last fiscal year and three fiscal years ago.

$$g_i = \frac{1}{t_{LFY} - t_{FY-3}} \frac{l_{LFY} - l_{FY-3}}{\alpha l_{LFY} + (1-\alpha) l_{FY-3}} \tag{1.13}$$

A common choice of weight is to set $\alpha = 1/2$. It has the advantage of making the growth measure symmetric and more comparable across different size groups(Moscarini and Postel-Vinay (2012)). By design the survey only covers firms that have survived until the interview. Therefore I could not observe job creation and destruction by entry and exit of firms. This narrows down my analysis to intensive margin of firms' ability to create jobs. Furthermore this also implies that my results are subject to survivor bias in the sense that I cannot observe firms that have exited since $FY - 3$.

Moreover as I try to explain the pattern of employment growth through access to external finance , I investigate the firm's performance in terms of fixed investment. MENA ES provides information on whether firms have purchased fixed asset during the last fiscal year. I construct a set of control variables that may plausibly affect

the ability of the firm to either grow or carry out fixed investment.

In particular, the MENA ES questionnaire includes three questions which provide information on characteristics and quality of firm's manager: gender, education and experience . *Manager education* assume a value of 1 if the manager holds a university degree and 0 otherwise. *manager experience* captures how many years of experience the manager has in the present sector. *Female CEO* is a dummy variable that indicates whether the top manager is female. Bloom and Van Reenen (2007) highlights the importance of manager's characteristics and argues it could attribute to explain the differences that exist in performance of firms even within narrowly defined sectors.

The MENA ES further provides information on the organization of firms. The variable *Foreign ownership* is a dummy variable that takes the value of 1 if it at least 10 percent of the firm is owned by foreign private individual or company. Foreign-owned firms may have access to internal capital markets and therefore be less dependent on the local banking system. The questionnaire also elicits firms' age and their initial size three fiscal yeas ago. The firms' employment growth are highly related to their initial size as the employment growth often slows down as the number of employees increase. Also firm's ability to grow and their strategic decision to carry out an investment highly depends on the life cycle of firms.

Finally, I construct three measures of firm quality. *Audited* equals one if the firm's accounts have been certified by an external auditor. This reduces information asymmetries and thereby facilitates access to finance. *Exporter* is an indicator equal to one if the firms exports at least ten percent of sales. This signals that the firm is competitive in international markets. Finally, *Iso Holder* indicates if the firm has earned a quality certification recognized by the International Organization for Standardization (ISO).Summary statistics are provided in Table REF. Some other studies such as Gorodnichenko and Schnitzer (2013) that use similar data (BEEPS) control in addition for total factor productivity, estimated based on cost shares for labour, material, and capital, adjusted for capacity utilization. Item non-response to quantitative questions in the MENA ES is high implying a large and likely non-random loss of observations, as a result of which I decide to not control for TFP.

In addition to the enterprise data from the MENA ES I use data on the location

of bank branches. EBRD has shared the data on bank branches in Morocco, Tunisia and Egypt. The compiled data on the location of bank branches in Lebanon comes from Betz and Ravasan (2016). [25] .

1.4.3 Access to Finance

The MENA ES measures firm access to finance along various dimensions. In particular, the MENA ES contains a set of questions that elicit the properties of these loans, which enables us to construct the measure representing collateral requirements by the ratio of collateral to loan value. To eliminate outliers, I winsorize the variable at the 5th and the 95th percentile of its distribution.

To measure the the discouragement I rely on a standard set of questions as used for instance in Popov and Udell (2010). The MENA ES first asks firms whether they have applied for a loan in the last fiscal year. Firms that did not apply for a loan are asked for the main reason they did not apply. Those firms that respond "no need for a loan" are classified as not credit constrained. Firms that cite other reasons such as complex application procedures, too high interest rates or collateral requirements, or simply did not believe that the application would be approved are considered credit constrained through demand or "discouraged". The MENA ES also asks firms to report the share of bank's credit in financing their expenses or fixed investment. They are considered that they do not have access to bank finance if they report zero.

1.5 Identification strategy: Non experimental treatment design

To study the effect of collateral policies on firm performances I follow three steps. First, Following two stages process of Betz and Ravasan (2016), I construct my treatment and control groups. Treatment group includes all firms that located in localities that banks with less stringent collateral policy have stronger presence. In the

[25] Most banks in the region by now provide a list of branches on their websites Betz and Ravasan (2016) have converted Branch addresses into coordinates using the geocode utility developed by Ozimek and Miles (2011).

the two stages process first, I recover each bank's collateral policy by exploiting the information on the identity of the bank granting the last line of credit to the firms that have been covered by MENA ES[26]. This enables me to construct a loans dataset of matching borrowers and lenders.

The collateral policy of an individual bank is then defined as the average conditional collateral requirement for all clients of that bank. It can be recovered through a regression of the collateral requirement on borrower characteristics and a bank-specific fixed effect. Borrower characteristics control for the idiosyncratic features of the client that may affect collateral demands. The bank-specific fixed effect then represents the collateral policy.The estimates for the first stage regression is reported in table 2.18.

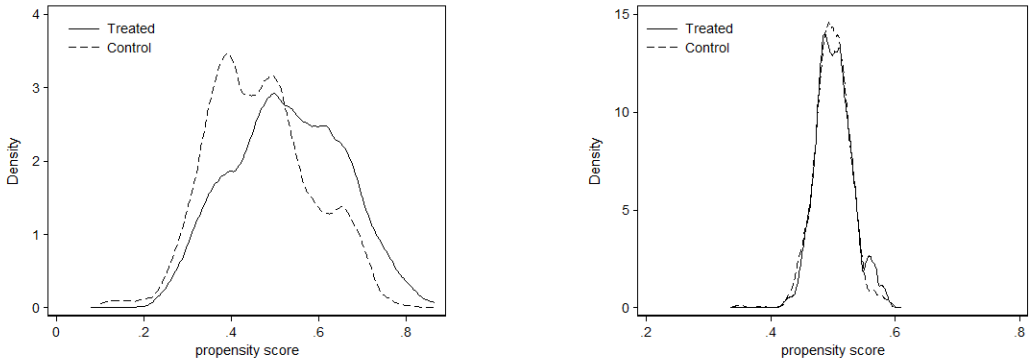
In the second stage, using the local banking methodology Beck et al. (2017), the estimated collateral policies are aggregated into the collateral index, reflecting market practice applied by banks in the locality where each firm is located. I use the geo-coordinates to identify all bank branches that located in a circle with a radius of 10km centered on each firm in the sample. Then by averaging the estimated collateral policies of all banks with branches in the circle I construct the local collateral index that represent the collateral practices prevailing in the vicinity of the firm. The index is branch-weighted such that banks with a greater number of branches in the circle receive greater weight in the index. Banks that do not have any branches receive a weight equal to zero. Finally I assign firms to treatment(control) group according to whether the local collateral practices in firm's neighborhood feature collateral ratio lower(higher) than median at country level. Figure1.16 shows the geographical distribution of firms in treatment and control groups.

In a second step, I balance the treatment and control groups to estimate the average effect of the treatment under assumptions of unconfoundedness Rosenbaum and Rubin (1983). The key empirical challenge here results from the potential non-random selection to the localities.Traditionally the literature relies on an assumption of what Heckman and Robb (1985) call "selection on observables" to identify

[26]This information is not part of the publicly available

the effects of treatment in the presence of non-random selection. However the robustness of this assumption is exposed to the failure of the linear conditioning and out of "common support" biasBlack and Smith (2004).

To overcome these problems. The literature relies on variety of balancing strategies that removes the statistical difference of the confounders between treated and untreated groups. First group of balancing strategies using matching methods where each treated unit is compared to control units with similar covariates. Other empirical strategies rely on reweighting observations so that the observable characteristics of the treatment and control group are similar after weightingHeckman et al. (1998); Hirano et al. (2003); Imbens (2004); Abadie and Imbens (2006); Heckman and Vytlacil (2007); Athey and Imbens (2017). In order to reduce the dimensionality of my balancing problem, I employ the propensity score which is defined as the predicted conditional probability of firm's selection to the localities with less stringent collateral policiesRosenbaum and Rubin (1983); Dehejia and Wahba (2002); Hirano et al. (2003). Then according to the estimated propensity scores I stratify my observation to quartiles. Furthermore it is also required that balance of covariates be achieved within each stratum. I employ the entropy balancing a la Hainmueller (2012). Here, entropy balancing relies on a maximum entropy reweighting scheme that calibrates unit weights by matching the first and second moments of propensity score distribution among treatment and control groups so that the reweighted treatment and control group satisfy a balance conditions within each stratum. 1.12 shows the distribution of propensity score after and before the balancing procedure. 1.6 reports the difference of covariates mean between treatment and control groups after and before the balancing procedure. I then implement within-stratum regression adjustment by using the corrected weights and adding the matrix of dummies (PSM) for quartiles and their interactions with dummy for young firms.



(a) Before balancing (b) After balancing

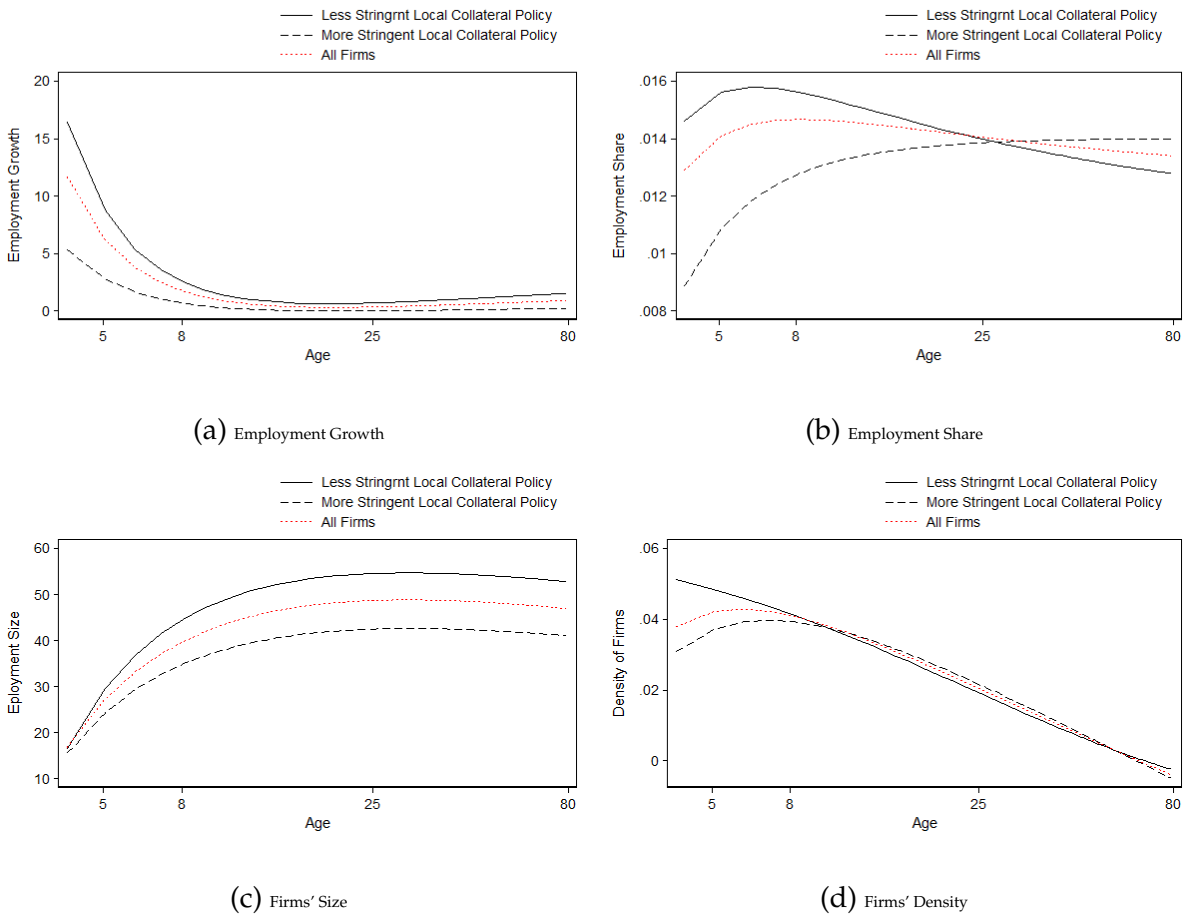
Figure 1.12: Propensity scores after and before balancing

1.6 Results

1.6.1 Firms' Performances and Local collateral Policy

I begin my empirical analysis by documenting how local collateral policy impact the stylized facts that I present in section 1.3. Using my constructed index for local collateral policy. I divide the sample of firms into two groups according to whether firm located in areas where the local collateral index is higher than median at country level. I then compare the firms' performances in these two groups.

Figure 1.13-(a) indicates that firms tend to expand more rapidly when they are located in areas with less stringent local collateral policy. This positive effect is stronger for firms that are in early stages of their life cycle. The positive effect gradually fades away as firm's age grows.



(a) Employment Growth

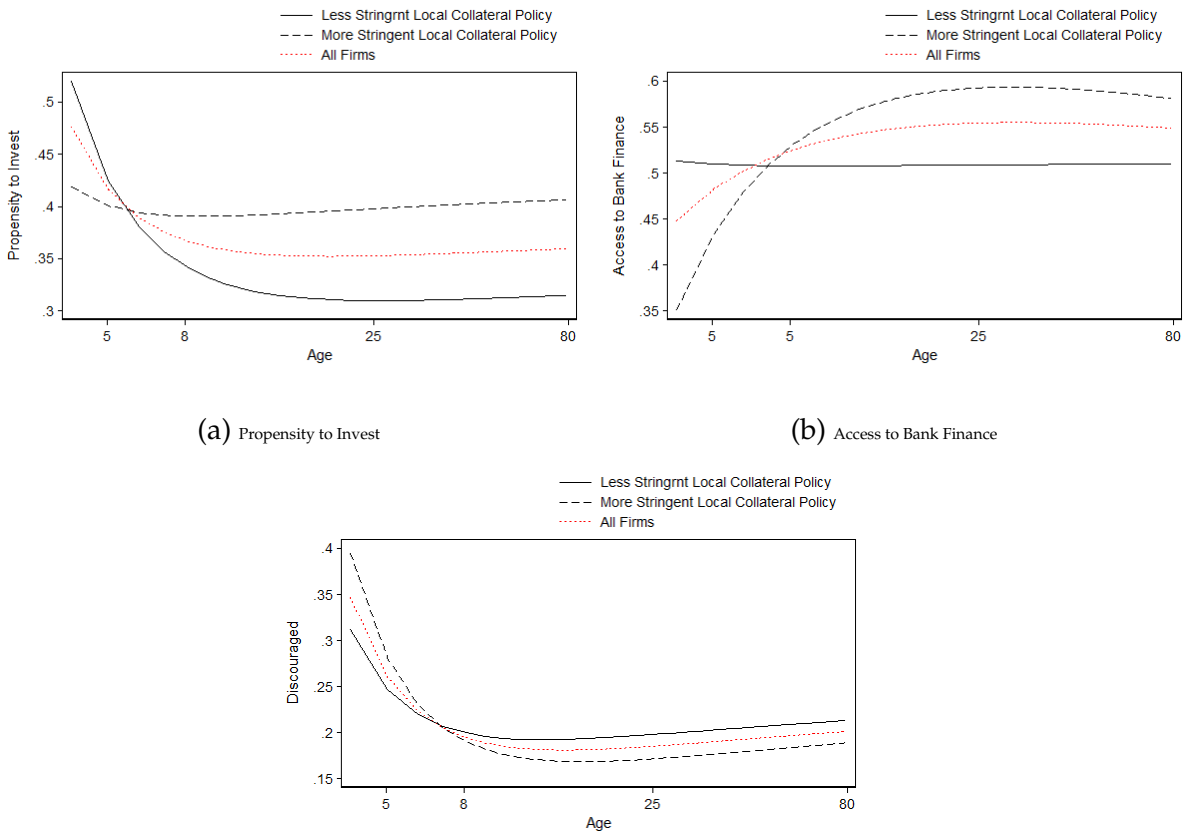
(b) Employment Share

(c) Firms' Size

(d) Firms' Density

Figure 1.13

Figure 1.13-(b) indicates younger cohorts of firms holds larger share of employment when they are located in areas where bank with less stringent collateral policy have stronger presence. The contribution of collateral policy to job creation is two folds . Less stringent collateral policy not only enhance the young firm's ability to create jobs but also locate higher share of employment in younger enterprises that could expand it faster. Figure 1.14-(a) indicates that younger firms are more prone to invest in fixed assets when they are located in areas with less stringent collateral policy. Their higher propensity to invest could stem from the fact they are less likely to get discouraged and they have more access to bank credit as have been shown in Figure 1.14-(b) and 1.14-(c). Next session delve into



(a) Propensity to Invest

(b) Access to Bank Finance

(c) Propensity to get Discouraged

Figure 1.14: Investment Behavior , Access to Finance

Figure 1.14-(a) indicates that younger firms are more prone to invest in fixed assets when they are located in areas with less stringent collateral policy. Their higher propensity to invest could stem from the fact they are less likely to get discouraged and they have more access to bank credit as have been shown in Figure 1.14-(b) and 1.14-(c). However the less stringent collateral policy has the opposite effect on mature firms in terms of investment access to finance and discouragement which shed lights on allocational effect of collateral policy across firm's life cycle. These three figures suggest the more stringent collateral policy might postpone the firms' investment to later stages of their life cycles as they have less access to external credit when they are younger. The latter arises from young firms' higher propensity of discouragement when they faced with more stringent local collateral policy.

1.6.2 Main Findings

Table 3.24 presents our core results.All columns control for country and sector specific macro shocks by including a full set of country and sector dummies. *Collateral Environment* is the variable of interest that represents collateral practices prevailing in the vicinity of the firm.*CollateralEnvironment* is a binary variable that takes 1 if the local collateral practices in firm's neighborhood feature collateral ratio higher than median at country level . More precisely *CollateralEnvironment* could be considered as the "Treatment dummy" indicates whether firm located in areas where banks that demand less collateral have a stronger presence.The specification includes the standard set of covariates to decrease a share of the unexplained variation in dependent variables between treated and control groups.

Employment Growth

Column (1) of table 3.24 indicates that how local collateral practice affects firms' ability to expand and create new jobs.The dependent variable in Column (1) is employment growth during the last three fiscal years. Furthermore, in line with conventional within firm's growth accounting , Column (1) additionally controls for *Initial Size* which captures the systematic relationship between firm size and growth rate. As young firms tend to have smaller size, including the *Initial Size* assures our results are not affected by size-growth relationship. The negative and significant coefficient of *Initial Size* implies the inverse relationship between firm size and growth[27] which runs counter to that described by Gibrat's law [28]

Column (1) of table 3.24 shows that, in areas where banks with more stringent collateral policy have a stronger presence, there is no statically significant difference between average growth rate of firms younger than 5 years and other firms. The interaction term between the dummy for young firms $(0-5\ year)$ and *collateral environment* is positive and statistically significant. This shows that young firms grow much faster by 7.69 percentage point if they are located in areas where banks ask lower collateral requirement have a stronger presence. The effect of lower collateral on growth rate of young firms is substantially large when I consider that the

[27] Evans (1987)

[28] Sutton (1997)

difference in the growth rate of the firm growing at the 75th percentile and the 50th percentile of the growth rate distribution is just about 4.5 percentage points. The insignificant coefficient on *collateral environment* shows impact of local presence of banks with less stringent collateral policy is indeed limited to young firms and do not have any significant effect on older firms' employment growth.This implies that younger firms exhibit much faster growth than average when they face less stringent collateral policy.

Investment Behavior

I argue that local collateral practice can affect firms' ability to create jobs through altering their ability to invest by easing or tightening their access to external finance. To support our argument, I directly relate collateral policies to firm's investment behavior.

Column (2) of Table 3.24 presents the results for the effect of collateral requirement on propensity of purchasing fixed assets by firm during last fiscal year. The insignificant coefficient of dummy for firms with less than five years indicates that in areas with more stringent local collateral requirement , there is no statistically significant gap between average investment propensity of firms younger than 5 years and other firms. The significant positive coefficient of *collateral environment* and significant positive interaction term indicate the differential effect of lower collateral requirement on young and mature firms. Young firms are more likely to invest when they face less stringent collateral policy. However lower degree of collateralization of loan decreases the propensity of investing in fixed assets among firms more than five years old.Column (2) indicates that the lower collateral requirement increases the propensity of investment for young firms by 33.6% while it decreases the probability of purchase of fixed assets for mature businesses by 11.1%. These results imply that lower collateral may have allocational effect , shifting away credit from mature firms toward their younger counterparts.However, it is worth to note that the magnitude of this effect is much stronger for young firms compared with mature businesses. To support this claim column (3) and (4) go one step further and investigate the impact of local collateral policy on firms' financial constraint.

Discouragement and Access to Finance

I argue that collateral policy could affect the firm's financial constraint through its impact on firm's evaluation of investment plan that is tended to be financed by external credit. Thus firms may self ration themselves from loan market that leads to a specific form of financial constraint which is called discouragement. Under discouragement , the low access to external finance is accompanied by low demand and less number of applicant due to higher discouragement.

In Column (3) I estimate the effect of *collateral environment* on firms' propensity to get discouraged from applying to a bank for a loan.It turns out the effect of collateral on discouragement follows the same pattern as effect of collateral on Investment.In Column (3), the highly significant positive coefficient of dummy for young firms indicates that young firms are more likely to get discouraged than average. However, young firms display a lower likelihood to get discourage by 15.5 % when they faced with a less stringent collateral environment as reflected in the significant positive interaction term.In contrast to firms younger than 5 years, mature firms are more prone to get discouraged when they faced with lower degree of collateralization.

In Column (4) I test directly the effect of collateral requirement on access to finance. The dependent variable is a dummy that takes 1 if firm has access to bank credit to invest in fixed assets or finance its expenses. The significant negative coefficient of dummy for young firms indicates that young firms' propensity to access to bank finance is 22.5% less than their mature counterparts'. Nonetheless, when these young firms are located where banks ask for less collateral requirement , their access to bank finance soar by 31.6% . The negative coefficient of *collateral environment* and a positive coefficient of interaction term follow the same pattern of allocational impact among young and mature firms which have been observed for discouragement and investment. However the insignificant coefficient of *collateral environment* suggests that the effect of lower collateral is limited to young firms.

1.6.3 Robustness Check: Alternative indexes for age and collateral Environment

Definition of young firms and age classification varies broadly in the literature. To explore the sensitivity of our estimates to age threshold for young firms, here in this section I repeat the main benchmark regressions for new age dummy that takes 1 if firms have less than 8 years.

Table 3.25 compares the regression' results when it includes age dummy for young firms less than 5 years and 8 years. The results do not change substantively , however the effect of lower collateral get weaker for younger firms when I use dummy for firms less than 8 years. Most notably , the positive effect of lower collateral lose its significance. The result suggests that the effect of the less stringent local collateral requirement on young firms' performances is not limited to firms less than five years. Furthermore to investigate the sensitivity of our results to the definition of collateral requirement, I reestimate our baseline regressions with alternative local collateral environment index. First , I use the difference between the local collateral requirement in vicinity of firm and median of local collateral requirement at country level as "collateral Environment" variable and I call it "CE1". In this case "collateral Environment" takes positive values if local collateral requirement at firm's neighborhood is lower than median of local collateral requirement at country level. The collateral requirement could be potentially disposed to outliers problems and one can argue our results are partly driven by these outliers. Therefore I use alternative variable instead of collateral ratio (LTV) in the first stage of our two step process to recover bank specific collateral. In the first stage regression I use a binary dependent variable that takes 1 if the Collateral ratio for the loan is higher than 1. Then I construct the new local collateral environment in second stage according to the estimated collateral policy based on this dummy dependent variable. I call this "Collateral Environment" variable "CE2".

Table 1.9 and 1.10 reports the estimated coefficient based on the based line "Collateral Environment" ("CE") , "CE1" and "CE2" . The regression results reported when specification use young firm dummy with threshold at either 5 or 8 years old.

Using "CE1" and "CE2", I find estimates of the lower collateral requirement on young firm's employment growth , investment , discouragement and access to fi-

nance are strongly similar to our baseline set of estimates. Moreover I find that the positive effects of lower collateral requirement on "discouragement" and access to "Bank Finance" become more significant when I use "CE1" and "CE2". For "Bank Finance", This significant results Also hold when I use young firm dummy for firms less than 8 years old and "CE2" as Collateral Environment

1.6.4 Analysis of Subsamples

In this section we re-estimate four regressions from our main benchmark over subsamples.

More precise identification of Entrepreneurial Firms

Following the entrepreneurship literature that defines entrepreneurial firms by demographic characteristics , I assume that young firms represent entrepreneurial firms in my main benchmark. However there exists a significant degree of heterogeneity among new businesses and not all of them pursue the risk taking/opportunity seeking behavior which is the heart of entrepreneurship definition (Knight (1921)). There are many new enterprises that enter the market out of necessity . They do not aspire any growth and thus they do not intend to take a risk and involve in any substantial investment[29]. These necessity oriented young businesses do not fit the high risk-high return structure of Entrepreneurial firms .
Within firms' properties and the characteristics of entrepreneurs such as educational background could help to narrow down the definition of entrepreneurial firms.

[29]See Block and Sandner (2009) , Schoar (2010) , Hurst and Pugsley (2011) and Poschke (2013)

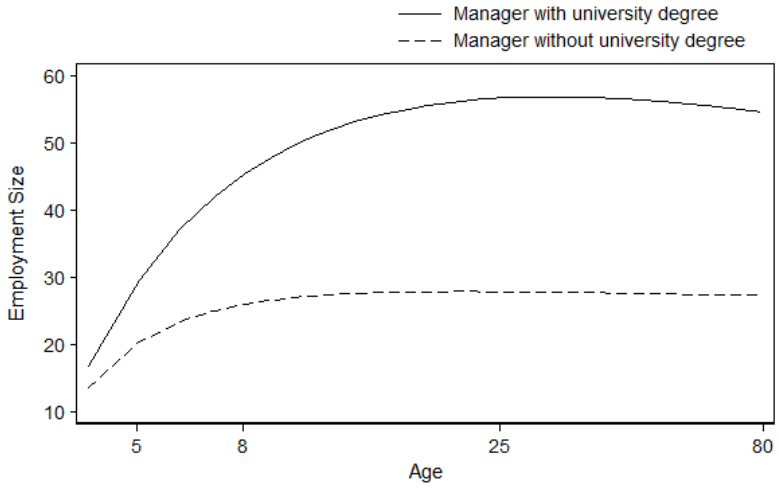


Figure 1.15: Evolution of employment size over life cycle

Figure 1.15 demonstrate the differential Evolution of employment size over life cycle for firms whose managers have university degree. It indicates that firms with a manger that has university degree expand faster and get larger.

The sample split analysis according to whether manager has a university degree shows that the results get stronger and more significant on subsample of firms whose manager have a university degree. Table 1.11 reports that

Collateral Constraint vs Collaterals' Rik-Return Distortion

This paper offers a new theory through that collateral could create missallocation against entrepreneurial businesses by suboptimally discourage risk taking behavior in the economy. Alternatively, Financial friction through "collateral constraint" could also raise aggregate inefficiency [30] which is biased against new businesses as they have less assets to pledge as collateral. The latter theory predicts the collateral constraint channel should be more severe among firms that hold less asset on their balance sheet. Splitting firms according to whether they have more asset than country's median level. I try to examine these two competing theories. Table 1.12 reports that the results stem from the subsample of firms with higher asset. Table 1.15 indicates that the high asset group also includes higher share of good quality firms

[30]See Bernanke and Gertler (1989) , Kiyotaki and Moore (1997) , Buera et al. (2011),Calvo et al. (2012) , Chaney et al. (2015)

compared with the low asset group. This implies that the former is more likely to entail entrepreneurial firms.

1.7 Conclusion

Entrepreneurial firms playing a prominent role in job creation. Hence governments are seeking variety of policy instruments to support them and promote their potential capabilities. This paper highlights the role of institutions , the cost they impose on financial transactions and their impact on binding the job creating prowess of young businesses.

Developing a model of adverse selection with heterogeneous borrowers across risk and return , this paper argues under low quality of collateral and bankruptcy laws , the aggressive collateralization binds the demand driven financial constraint of young firms that tend to engage in entrepreneurship activities and risk taking behaviors.

Drawing on a novel firm-level dataset on four MENA economies that have some of the poorest legal strength on collateral and bankruptcy laws , First I document the importance of young businesses in job creation in these economies. My stylized facts stress the potential role of demand driven financial constraint and discouragement in binding the young firm's potential job creation.

I then analyze the impact of collateral policy on young firms' performances by constructing the index for local collateral policy that prevails in vicinity of each firms. I find that new enterprises are more likely to invest and expand their employment when they are located in areas that banks with less stringent collateral policy have stronger presence. I also find that a favorable collateral environment encourages young firms to apply for a loan and enhance their access to bank finance.

However my estimates exploit variation in collateral practices among countries with very similar institutional frameworks . I plan to expand my sample data to set of 21 countries in Central and Eastern Europe that have a comparable data to investigate the impact of cross country institutional differences. Furthermore I plan

to incorporate the external data on banks' lending technique such as BEPS II [31] in my analysis that I leave for future work.

[31] Beck et al. (2017)

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Appendix I : Tables and Figures

Table 1.1: Business Environment In Four MENA Economies

Economy	Quality of Institutions	Collateral Lending		Credit Constrained		Quality of Entrepreneur
	Strength of Collateral and Bankruptcy Law index (0-12)	Collateral ratio (%)	Share of Collateralized Loans (%)	Rationed by Demand Discouraged (%)	Rationed by Supply Applied and Rejected (%)	Manager with University Degree
Egypt, Arab Rep.	2	272	92.4	95.2	4.8	79.9
Lebanon	2	208	68.7	85.9	14.1	72.1
Morocco	2	166	84	86	14	78
Tunisia	2	252	87	88.3	11.7	70.4
MENA ES	1.1	208	78.8			
Lower middle income	5.2	197	79.7			
Upper middle income	5.3	190	74.8			
High income: nonOECD	4.6	180	76			
High income: OECD	5.8	148	63.7			

Note: The table presents statistics on, Strength of legal rights index that measures the quality of collateral and bankruptcy laws . The index ranges from 0 to 12, with higher scores indicating the better quality.(Source: World Bank, Doing Business project) ; Collateral lending practices ; the composition of credit constrained firms and Quality of Entrepreneurs

Table 1.2: Summary statistics

	Sectoral Composition		Age and Size		Manager Characteristics		
	(1) Manu-facturing	(2) Retail	(3) Younger than 5 years	(4) SME	(5) University degree	(6) Experience in years	(7) Female CEO
Morocco	0.380	0.090	0.087	0.882	0.780	22.388	0.043
Egypt	0.551	0.156	0.330	0.932	0.799	18.354	0.071
Lebanon	0.268	0.263	0.135	0.938	0.721	27.552	0.044
Tunisia	0.422	0.057	0.102	0.888	0.704	24.574	0.085

	Firm Organization	Firm Quality			Political Environment	
	(8) Foreign owned	(9) Audited accounts	(10) Exporter	(11) Iso Holders	(12) Political instability	(13) Number of firms
Morocco	0.120	0.473	0.119	0.162	0.313	407
Egypt	0.072	0.690	0.074	0.102	0.770	2897
Lebanon	0.029	0.844	0.318	0.134	0.906	561
Tunisia	0.117	0.745	0.302	0.162	0.593	592

Note: The Table presents statistics on, sectoral composition between manufacturing, retail and services, share of firms younger than 5 years old, share of SMEs (firms which have less than 100 permanent employees), share of firms whose manager has a university degree, average experience of the manager, share of firms with female CEO, share of firms which more than 10% of them owned by private foreign individuals, share of audited firms, share of firms that exports, share of firms that hold Iso (organizational quality) certificate, share of firms that declare political instability is "Major" or "very severe" obstacle and total number of firms by country.

Table 1.3: Banks' characteristics at locality level

	N	Mean	Standard Deviation	Source
Foreign Bank	3489	0.37	0.16	BEPS
Small Bank	4151	0.24	0.21	BankScope
Non Peforming Laon to Gross Loan	4130	7.79	2.46	BankScope
Net loan to asset	4151	43.67	15.28	BankScope
HHI	4151	0.17	0.23	BEPS/Betz and Ravasan
Bank's average Collateral ratio	4151	201.85	25.14	MENA ES
Bank's propensity to lend with Collateral ratio>200 %	4151	0.34	0.08	MENA ES
Relationship Lender	3489	0.47	0.17	BEPS

Note: The Table presents statistics on the locality level lending environment. These locality level bank characteristics has been constructed based on branch-weighted average of the banks' characteristics that have branches in a circle with radius 10km centered on the sample firm. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands).local share of Relationship Lenders (Bank defines soft information as very important in lending to SME) The locality-level Herfindahl-Hirschmann index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. The branch-weighted average of the banks' net loan to total assets.

Table 1.4: First stage regression

Dependent Variable	(1) Value of collateral (% of the loan amount)	(2) Collateral Ratio over 200%
0-5 years	-43.146**	-0.161**
	(20.28)	(0.07)
sme	17.915	0.111**
	(15.03)	(0.05)
Iso Holder	21.424	0.094*
	(15.63)	(0.05)
exporter	-26.866*	-0.088*
	(14.87)	(0.05)
audit	-22.806	-0.069
	(17.08)	(0.06)
female CEO	-18.908	0.012
	(27.32)	(0.09)
manager with university degree	-15.663	-0.060
	(14.90)	(0.05)
manager's experience	-0.314	-0.001
	(0.54)	(0.00)
foreign ownership	-31.889	-0.075
	(22.84)	(0.08)
p_ind	-3.634	-0.059
	(15.03)	(0.05)
Constant	247.966***	0.447***
	(30.09)	(0.10)
Sectors	Yes	Yes
Observations	568	568
σu	83.572	.335
σe	133.763	.442
ρ (fraction of variance due to u_i)	.280	.365
F test that all $u_i = 0$:	$F(66, 476) = 1.27$	$F(81, 756) = 1.68$
	$Prob > F = 0.087$	$Prob > F = 0.001$
Observations	568	568

*Note: OLS regression in column (1) and Probit regression in column (2) based on survey-weighted observations (Stata's svy prefix). Both regressions are estimated on the subsample of firms with a loan or line of credit. The dependent variable in column (1) is value Of collateral required for the most recent loan measured as a percentage of the loan amount. The dependent variable in column (2) is a dummy variable takes value 1 when collateral ratio is higher than 200%, . ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 1.5: Estimation of propensity score

Propensity of Treatment	
	b/se
young than 8 years	0.158
	(0.28)
younger than 5 years	0.227
	(0.40)
sme	0.113
	(0.15)
Iso holder	0.131
	(0.16)
exporter	0.268*
	(0.14)
audit	0.237*
	(0.13)
female CEO	-0.057
	(0.20)
manager with university degree	0.242**
	(0.12)
manager's experience	0.005
	(0.00)
foreign ownership	-0.052
	(0.16)
Political Instability Index	-0.194*
	(0.10)
Iso holder × young than 5 years	-1.356**
	(0.60)
audit × young than 5 years	0.121
	(0.48)
audit × young than 8 years	-0.141
	(0.34)
	(0.45)
Localities	Yes
Sectors	Yes
Observations	3376

Table 1.6: The firm level characteristics before and after balancing procedure in localities with More or less stringent collateral policy

	(1) Unadjusted b/p	(2) Adjusted b/p
Located in locality with less stringent Collateral Environment		
0-5 years	0.237	-0.025
	(0.17)	(0.90)
sme	0.076	-0.009
	(0.61)	(0.96)
Iso holder	0.044	-0.054
	(0.79)	(0.76)
exporter	0.232*	0.042
	(0.06)	(0.75)
audit	0.173*	-0.046
	(0.08)	(0.70)
female CEO	-0.091	-0.005
	(0.63)	(0.98)
manager with university degree	0.204	0.012
	(0.11)	(0.93)
manager's experience	0.004	0.001
	(0.35)	(0.77)
foreign ownership	-0.034	-0.004
	(0.84)	(0.98)
Political Instability Index	-0.208*	-0.045
	(0.09)	(0.72)
Observations	3376	3376

*Note: Probit regression in columns using survey-weighted observations (Stata's svy prefix). Dependent variable is dummy that takes 1 if local collateral environment is better than country median level. Local collateral environment has been constructed based on branch-weighted average of the collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 1.7: Impact of Local Collateral Policy : Employment growth, Investment And Financial constraints

	(1) Employment Growth (%) b/se	(2) Purchase of Fixed Assets b/se	(3) Discouraged b/se	(4) Bank Finance b/se
Collateral Environment	-1.371	-0.483***	0.277**	-0.032
	(0.97)	(0.16)	(0.12)	(0.25)
0-5 years	-0.179	-0.757*	1.031**	-1.172
	(5.63)	(0.40)	(0.42)	(1.46)
0-5 years × Collateral Environment	8.459*	1.117***	-0.710*	0.961**
	(4.53)	(0.37)	(0.38)	(0.48)
Initial size (Log)	-5.609***			
PSM	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes
Observations	3239	3333	3350	928

*Note: OLS regression in column (1) and Probit regression in columns (2-4) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1) is Employment Growth rate. The dependent variable in column (2) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The dependent variable in column (3) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (4) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit. "collateral environment " is a dummy that takes 1 if local collateral environment is better than country median level. Local collateral environment has been constructed based on branch-weighted average of the collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18. PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young5. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. The branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, having a quality certification recognized by the International Organization for Standardization (ISO), having audited financial reports. . ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 1.8: Threshold For Young Firms: 5 vs 8 Years Old

	Employment Growth (%)		Purchase of Fixed Assets		Discouraged		Bank Finance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\leq$ 5 years	$\leq$ 8 years	$\leq$ 5 years	$\leq$ 8 years	$\leq$ 5 years	$\leq$ 8 years	$\leq$ 5 years	$\leq$ 8 years
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
main								
Collateral Environment	-1.371	-1.838*	-0.483***	-0.494***	0.277**	0.356***	-0.032	-0.100
	(0.97)	(1.08)	(0.16)	(0.18)	(0.12)	(0.13)	(0.25)	(0.28)
young=1	-0.179	-2.056	-0.757*	-0.469	1.031**	0.272	-1.172	-0.859
	(5.63)	(4.11)	(0.40)	(0.46)	(0.42)	(0.47)	(1.46)	(0.99)
young=1 $\times$ Collateral Environment	8.459*	6.132*	1.117***	0.626**	-0.710*	-0.658**	0.961**	0.773
	(4.53)	(3.29)	(0.37)	(0.26)	(0.38)	(0.29)	(0.48)	(0.48)
Initial size (Log)	-5.609***	-5.657***						
	(0.58)	(0.62)						
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3239	3239	3333	3333	3350	3350	928	928

Note: OLS regression in column (1-2) and Probit regression in column (3-8) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1-2) is Employment Growth rate. The dependent variable in column (3-4) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The dependent variable in column (5-6) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (7-8) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit . "collateral environment " is a dummy that takes 1 if local collateral environment is better than country median level. Local collateral environment been constructed based on branch-weighted average of the collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18. PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. The branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, having a quality

Table 1.9: Alternative Collateral Index

	Employment growth (%)						Purchase of fixed assets (%)					
	≤ 5 years			≤ 8 years			≤ 5 years			≤ 8 years		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Collateral Index I	Collateral Index II	Collateral Index III	Collateral Index I	Collateral Index II	Collateral Index III	Collateral Index I	Collateral Index II	Collateral Index III	Collateral Index I	Collateral Index II	Collateral Index III
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-1.371	0.045	0.148	-1.838*	0.038	0.072	-0.483***	-0.013	-0.026	-0.494***	-0.011	-0.021
	(0.97)	(0.06)	(0.18)	(1.08)	(0.07)	(0.18)	(0.16)	(0.01)	(0.03)	(0.18)	(0.01)	(0.03)
young	-0.179	6.709**	6.029**	-2.056	4.033**	3.697*	-0.757*	0.470**	0.366**	-0.469	0.291**	0.237*
	(5.63)	(2.74)	(2.62)	(4.11)	(2.00)	(1.95)	(0.40)	(0.18)	(0.18)	(0.46)	(0.14)	(0.14)
young × Collateral Environment	8.459*	0.288***	0.684**	6.132*	0.180**	0.521	1.117***	0.048***	0.090**	0.626**	0.022	0.024
	(4.53)	(0.10)	(0.31)	(3.29)	(0.09)	(0.33)	(0.37)	(0.01)	(0.04)	(0.26)	(0.01)	(0.03)
Initial size (Log)	-5.609***	-5.887***	-5.826***	-5.657***	-5.873***	-5.827***						
	(0.58)	(0.58)	(0.58)	(0.62)	(0.60)	(0.59)						
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3239	3239	3239	3239	3239	3239	3333	3333	3333	3333	3333	3333

Note: The "collateral environment " for collateral Index I in column (1) ,(4) , (7) and (10) is a dummy variable takes 1 if local collateral environment is higher than country median level and it is constructed based on collateral ratio that estimated in table 2.18 ; The "collateral environment " for collateral Index II in column (2) ,(5) and (8) and (11) is a continues variable that indicates the distance of local collateral environment from country median level and it is constructed based on collateral ratio that estimated in table 2.18 ; The "collateral environment " for collateral Index III in column (3) ,(6) , (9) and (12) is a continues variable that indicates the distance of local collateral environment from country median level and it is constructed based on a dummy variable that takes 1 if collateral ratio is higher than 200%. The estimated value reported in table 2.18 OLS regression in column (1-6) and Probit regression in column (7-12) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1-6) is Employment Growth rate. The dependent variable in column (7-12) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The "collateral environment " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18. PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are

Table 1.10: Alternative Collateral Index

	Discouraged (%)						Access To Bank Finance (%)					
	≤ 5 years			≤ 8 years			≤ 5 years			≤ 8 years		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Collateral Index I	Collateral Index II	Collateral Index III	Collateral Index I	Collateral Index II	Collateral Index III	Collateral Index I	Collateral Index II	Collateral Index III	Collateral Index I	Collateral Index II	Collateral Index III
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Collateral Environment	0.277**	-0.003	-0.017	0.356***	-0.002	-0.012	-0.032	-0.002	-0.008	-0.100	-0.009	-0.032
	(0.12)	(0.01)	(0.02)	(0.13)	(0.01)	(0.03)	(0.25)	(0.02)	(0.06)	(0.28)	(0.02)	(0.05)
young=1	1.031**	0.164	0.229	0.272	0.033	0.074	-1.172	-0.147	-0.206	-0.859	-0.108	-0.158
	(0.42)	(0.19)	(0.19)	(0.47)	(0.16)	(0.16)	(1.46)	(0.43)	(0.43)	(0.99)	(0.32)	(0.31)
young × Collateral Environment	-0.710*	-0.033***	-0.093***	-0.658**	-0.027***	-0.075**	0.961**	0.068***	0.248***	0.773	0.059*	0.221**
	(0.38)	(0.01)	(0.03)	(0.29)	(0.01)	(0.03)	(0.48)	(0.02)	(0.07)	(0.48)	(0.03)	(0.10)
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3356	3356	3356	3356	3356	3356	928	928	928	928	928	928

Note: The "collateral environment " for collateral Index I in column (1) ,(4) , (7) and (10) is a dummy variable takes 1 if local collateral environment is higher than country median level and it is constructed based on collateral ratio that estimated in table 2.18 ; The "collateral environment " for collateral Index II in column (2) ,(5) and (8) and (11) is a continues variable that indicates the distance of local collateral environment from country median level and it is constructed based on collateral ratio that estimated in table 2.18 ; The "collateral environment " for collateral Index III in column (3) ,(6) , (9) and (12) is a continues variable that indicates the distance of local collateral environment from country median level and it is constructed based on a dummy variable that takes 1 if collateral ratio is higher than 200%. The estimated value reported in table 2.18 OLS regression in column (1-6) and Probit regression in column (7-12) using survey-weighted observations (Stata's svy prefix). TThe dependent variable in column (3) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (4) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit . The "collateral environment " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18. PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. The branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but not reported

Table 1.11: Excluding the Non Entrepreneurial firms

	Employment Growth (%)		Purchase of Fixed Assets		Discouraged		Bank Finance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Manager with University Degree	All Firms	Manager With University Degree	All Firms	Manager With University Degree	All Firms	Manager With University Degree	All Firms
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-2.641***	-1.371	-0.518***	-0.483***	0.252*	0.277**	-0.078	-0.032
	(1.01)	(0.97)	(0.18)	(0.16)	(0.14)	(0.12)	(0.27)	(0.25)
0-5 years	-1.993	-0.179	-0.477	-0.757*	1.077**	1.031**	-1.323	-1.172
	(5.93)	(5.63)	(0.33)	(0.40)	(0.44)	(0.42)	(1.35)	(1.46)
0-5 years × Collateral Environment	11.560**	8.459*	1.077***	1.117***	-0.864**	-0.710*	2.197***	0.961**
	(5.16)	(4.53)	(0.41)	(0.37)	(0.40)	(0.38)	(0.78)	(0.48)
Initial size (Log)	-5.288***	-5.609***						
	(0.63)	(0.58)						
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2431	3259	2509	3353	2526	3370	1166	703

*Note: OLS regression in column (1-2) and Probit regression in column (3-8) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1-2) is Employment Growth rate. The dependent variable in column (3-4) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The dependent variable in column (5-6) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (7-8) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit . "collateral environment " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18.In all columns, PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. The branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, having a quality certification recognized by the International Organization for Standardization (ISO), having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 1.12: Collateral Constraint vs Collateral Risk Return Distortion Hypothesis

	Employment Growth (%)		Purchase of Fixed Assets		Discouraged		Bank Finance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High Asset	Low Asset	High Asset	Low Asset	High Asset	Low Asset	High Asset	Low Asset
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-2.106	-0.236	-0.501***	-0.340	0.306	0.008	0.036	0.088
	(1.67)	(1.49)	(0.19)	(0.26)	(0.20)	(0.21)	(0.40)	(0.54)
0-5 years	-6.919	3.376	-1.651***	-1.238	0.915	-0.306	-1.531	-2.274
	(5.59)	(6.04)	(0.62)	(0.84)	(1.24)	(0.84)	(1.24)	(1.92)
0-5 years × Collateral Environment	23.818***	3.412	2.357***	0.763	-2.436***	0.131	2.617**	0.005
	(4.43)	(3.96)	(0.51)	(0.56)	(0.43)	(0.62)	(1.10)	(0.99)
Initial size (Log)	-5.531***	-6.397***						
	(1.10)	(0.91)						
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1281	1349	1317	1369	1335	1372	422	321

*Note: OLS regression in column (1-2) and Probit regression in column (3-8) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1-2) is Employment Growth rate. The dependent variable in column (3-4) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The dependent variable in column (5-6) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (7-8) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit . "collateral environment " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18.In all columns, PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include banks' characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as foreign owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. The branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, having a quality certification recognized by the International Organization for Standardization (ISO), having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 1.13: Ratio of land in tangible assets

	Employment Growth (%)		Purchase of Fixed Assets		Discouraged		Bank Finance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High Real estate Ratio	Low Real estate Ratio	High Real estate Ratio	Low Real estate Ratio	High Real estate Ratio	Low Real estate Ratio	High Real estate Ratio	Low Real estate Ratio
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-0.601	4.515**	-0.211	-0.269	0.306	0.065	1.833***	-0.185
	(2.06)	(1.80)	(0.27)	(0.26)	(0.23)	(0.25)	(0.53)	(0.35)
0-5 years	-5.432	1.193	-0.734	-0.009	1.651*	-1.849**	-8.616***	-0.120
	(6.04)	(13.08)	(0.97)	(0.85)	(0.91)	(0.81)	(2.44)	(1.45)
0-5 years × Collateral Environment	14.111*	7.546	3.368***	1.122*	-2.120**	-0.446	6.546***	2.874***
	(7.60)	(5.88)	(0.67)	(0.65)	(0.87)	(0.76)	(1.07)	(0.73)
Initial size (Log)	-3.525***	-5.190***						
	(1.34)	(0.98)						
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1281	1349	1317	1369	1335	1372	422	321

*Note: OLS regression in column (1-2) and Probit regression in column (3-8) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1-2) is Employment Growth rate. The dependent variable in colu (3-4) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The dependent variable in column (5-6) is a dummy variable takes value 1 if firm does not apply for a loan any reason other than no need for a loan due to sufficient funds. The dependent variable in column (7-8) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit . "collateral environm " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fi effect regressions reported in table 2.18.In all columns, PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include ban characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as fore owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. T branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, having a quality certificat recognized by the International Organization for Standardization (ISO), having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

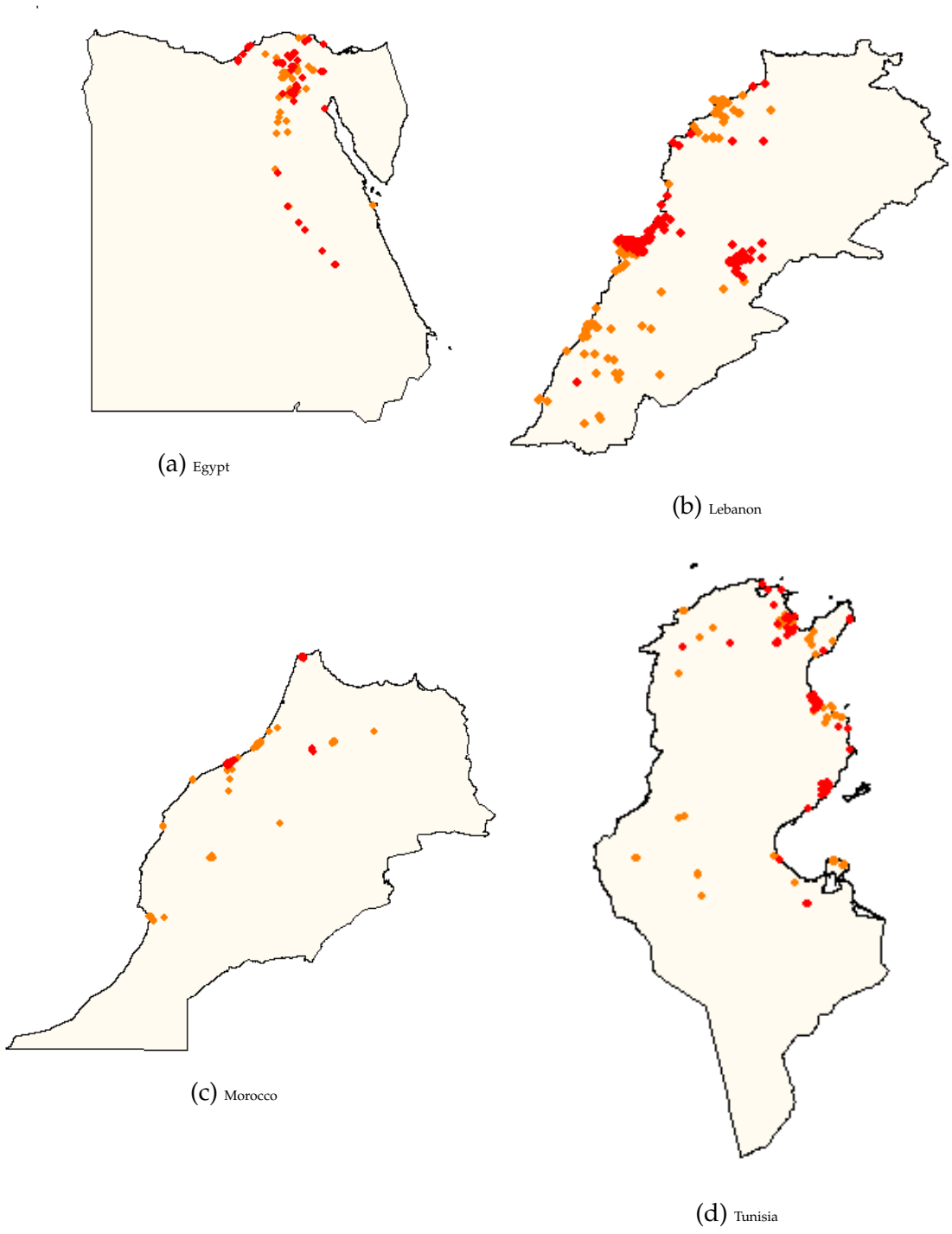
Table 1.14: Informal finance

	Employment Growth (%)		Purchase of Fixed Assets		Discouraged		Bank Finance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High Informality	Low Informality	High Informality	Low Informality	High Informality	Low Informality	High Informality	Low Informality
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-0.542	-1.877*	-0.409**	-0.496**	0.045	0.364**	-0.129	-0.178
	(1.25)	(1.13)	(0.21)	(0.21)	(0.18)	(0.15)	(0.33)	(0.31)
0-5 years	5.580	-4.370	0.005	-1.547***	2.155***	-0.455	-2.631	-0.386
	(8.69)	(5.99)	(0.57)	(0.50)	(0.64)	(0.91)	(1.60)	(1.11)
0-5 years × Collateral Environment	2.985	14.140***	0.606	1.367***	-0.366	-0.928*	2.424	1.430**
	(5.41)	(5.17)	(0.66)	(0.40)	(0.58)	(0.48)	(1.60)	(0.63)
Initial size (Log)	-4.665***	-5.615***						
	(0.72)	(0.76)						
PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm's Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1485	1754	1517	1791	1531	2611	395	523

*Note: OLS regression in column (1-2) and Probit regression in column (3-8) using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1-2) is Employment Growth rate. The dependent variable in colu (3-4) is a dummy variable takes value 1 if firm carries out an investment in fixed asset during the last fiscal year (during 2012). The dependent variable in column (5-6) is a dummy variable takes value 1 if firm does not apply for a loan any reason other than no need for a loan due to sufficient funds. The dependent variable in column (7-8) is a dummy variable takes value 1 if firm has financed part of its expenses or fixed investment by bank's credit . "collateral environm " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fi effect regressions reported in table 2.18.In all columns, PSM includes the dummies for quartiles of propensity scores that estimated in 1.5 as well as interactions of these dummies with variable young. Locality level controls include ban characteristics at locality level.It includes the local share of Small banks that has less than EUR 5 billion in assets (The lowest quartile of asset distribution in sample of all banks). Local share of foreign banks (A bank is classified as fore owned if at least half of its equity is in foreign hands). The locality-level Herfindahl-Hirschmann Index where market shares are measured by branches. The branch-weighted average of the banks' non performing loan to gross loans. T branch-weighted average of the banks' net loan to total assets.Locality variables also contains the matrix of dummies for five categories of cities from (Capital city to small villages). In all columns Other Firm's control variables included but reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, having a quality certificat recognized by the International Organization for Standardization (ISO), having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 1.15: Quality of firms in sub sample of High Asset vs Low Asset

	(1) Iso Holder (%)	(2) Audited (%)	(3) Exporter (%)	(4) Manage with University Degree (%)
Low Asset	8.2	65.6	16.7	69.9
High Asset	21.4	79.7	27.8	76.6
Observations	2974	2974	2959	2967



(a) Egypt

(b) Lebanon

(c) Morocco

(d) Tunisia

Figure 1.16: The red(yellow) dots indicate localities with less(more) stringent collateral policy compared with country's median level

Appendix II : Theoretical Appendix

Appendix II.a:

The average θ is given by

$$\bar{\theta}_{t+1} = \frac{\theta_l \Gamma(\theta_L, \bar{\theta}_t) + \theta_h \Gamma(\theta_H, \bar{\theta}_t)}{\Gamma(\theta_L, \bar{\theta}_t) + \Gamma(\theta_H, \bar{\theta}_t)} \tag{1.14}$$

In which

$$\Gamma(\theta_i, \bar{\theta}_t) = \frac{1}{\frac{(1+r)}{\theta_i}[\frac{\theta_i}{\bar{\theta}_t} - \zeta(\frac{\theta_i}{\bar{\theta}_t} - 1) + \zeta\eta(\frac{1}{\theta_i} - 1)]}$$

Therefore we could rewrite equation 1.14 as

$$\bar{\theta}_{t+1} = \frac{\frac{1}{(1+r)}[\theta_l \frac{\frac{1}{1-x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_l}) + \zeta\eta(\frac{1}{\theta_l} - 1)]} + \theta_h \frac{\frac{1}{1+x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_h}) + \zeta\eta(\frac{1}{\theta_h} - 1)]}]}{\frac{1}{(1+r)}\frac{\frac{1}{1-x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_l}) + \zeta\eta(\frac{1}{\theta_l} - 1)]} + \frac{\frac{1}{1+x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_h}) + \zeta\eta(\frac{1}{\theta_h} - 1)]}} \tag{1.15}$$

In which $\Theta = \theta^* = \frac{\theta_L + \theta_H}{2}$, $x = \frac{\frac{\theta_H - \theta_L}{2}}{\Theta}$ and $\Delta_t = \frac{\bar{\theta}_t - \Theta}{\Theta}$

Δ is variable of my interest that shows the deviation of average risk of applicants from allocationally efficient level. If Δ is not equal to zero. It implies there is a missallocation of credit in the market $\Delta \succ 0$ suggests that missallocation is against Low risk borrowers and $\Delta \prec 0$ implies that missallocation is against high risk borrowers. Rewriting θ_L,θ_H and $\bar{\theta}$ as a function of x and Θ I could drive the following equations

I could simplify the equation 1.15 as following

$$\bar{\theta}_{t+1} = \frac{\frac{1}{(1+r)}[\theta_l \frac{\frac{1}{1-x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\bar{\theta}_l}) + \zeta\eta(\frac{1}{\bar{\theta}_l} - 1)]} + \theta_h \frac{\frac{1}{1+x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_h}) + \zeta\eta(\frac{1}{\theta_h} - 1)]}]}{\frac{1}{(1+r)}[\frac{\frac{1}{1-x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_l}) + \zeta\eta(\frac{1}{\theta_l} - 1)]} + \frac{\frac{1}{1+x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{1}{\theta_h}) + \zeta\eta(\frac{1}{\theta_h} - 1)]}]}$$

$$\bar{\theta}_{t+1} = \Theta\frac{\frac{1}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{\Theta}{\theta_l}\frac{1}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_l}\frac{1}{\Theta} - \Theta\frac{1}{\Theta})]} + \frac{1}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{\Theta}{\theta_h}\frac{1}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_h}\frac{1}{\Theta} - \Theta\frac{1}{\Theta})]}}{[\frac{\frac{1}{1-x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{\Theta}{\theta_l}\frac{1}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_l}\frac{1}{\Theta} - \Theta\frac{1}{\Theta})]} + \frac{\frac{1}{1+x}}{[\frac{1}{\bar{\theta}_t} - \zeta(1-\eta)(\frac{1}{\bar{\theta}_t} - \frac{\Theta}{\theta_h}\frac{1}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_h}\frac{1}{\Theta} - \Theta\frac{1}{\Theta})]}]}$$

$$\bar{\theta}_{t+1} = \frac{\frac{1}{1-\zeta(1-\eta)(1-\frac{\Theta}{\theta_l}\frac{\bar{\theta}_t}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_l}\frac{\bar{\theta}_t}{\Theta} - \Theta\frac{\bar{\theta}_t}{\Theta})} + \frac{1}{1-\zeta(1-\eta)(1-\frac{\Theta}{h}\frac{\bar{\theta}_t}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_h}\frac{\bar{\theta}_t}{\Theta} - \Theta\frac{\bar{\theta}_t}{\Theta})}}{\frac{\frac{1}{1-x}}{1-\zeta(1-\eta)(1-\frac{\Theta}{\theta_l}\frac{\bar{\theta}_t}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_l}\frac{\bar{\theta}_t}{\Theta} - \Theta\frac{\bar{\theta}_t}{\Theta})} + \frac{\frac{1}{1+x}}{1-\zeta(1-\eta)(1-\frac{\Theta}{h}\frac{\bar{\theta}_t}{\Theta}) + \zeta\eta(\frac{\Theta}{\theta_h}\frac{\bar{\theta}_t}{\Theta} - \Theta\frac{\bar{\theta}_t}{\Theta})}}$$

$$\bar{\theta}_{t+1}\frac{\frac{1}{1-\zeta(1-\eta)(1-\frac{1+\Delta_t}{1-x}) + \zeta\eta(\frac{1+\Delta_t}{1-x} - \Theta(1+\Delta_t))} + \frac{1}{1-\zeta(1-\eta)(1-\frac{1+\Delta_t}{1+x}) + \zeta\eta(\frac{1+\Delta_t}{1+x} - \Theta(1+\Delta_t))}}{\frac{\frac{1}{1-x}}{1-\zeta(1-\eta)(1-\frac{1+\Delta_t}{1-x}) + \zeta\eta(\frac{1+\Delta_t}{1-x} - \Theta(1+\Delta_t))} + \frac{\frac{1}{1+x}}{1-\zeta(1-\eta)(1-\frac{1+\Delta_t}{1+x}) + \zeta\eta(\frac{1+\Delta_t}{1+x} - \Theta(1+\Delta_t))}}$$

Simplifying the equations we could proceed as follows

$$\bar{\theta}_{t+1} = \Theta\frac{\zeta(1+\Delta_t) + (1-x^2)[1-\zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta]}{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta}$$

$$\bar{\theta}_{t+1} = \Theta\frac{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta - x^2[1-\zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta]}{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta}$$

$$\bar{\theta}_{t+1} = \Theta(1 - \frac{x^2[1-\zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta]}{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta})$$

$$\bar{\theta}_{t+1} - \Theta = -\Theta\frac{x^2[1-\zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta]}{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta}$$

$$\frac{\bar{\theta}_{t+1} - \Theta}{\Theta} = -\frac{x^2[1-\zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta]}{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta}$$

$$\Delta_{t+1} = -x^2\frac{1-\zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta}{\zeta(1+\Delta_t) + 1 - \zeta(1-\eta) - \zeta\eta(1+\Delta_t)\Theta}$$

x is a indicator for bank's screening error. When x=.5 it means bank has 100 % screening error. The last equation shows $\|\Delta\| \preceq x^2$. Thus , for $x \preceq .5 \Rightarrow \Delta^2 \preceq .0125$ By assuming $\Delta^2 \approx 0$, we could drive Δ_{t+1} as following.

$$\Delta_{t+1} = \alpha\Delta_t + \beta \tag{1.16}$$

$$\alpha = \frac{x^2\zeta\eta\Theta}{1+\zeta\eta(1-\Theta)}$$

$$\beta = \frac{-x^2[1-\zeta(1-\eta(1-\Theta))]}{1+\zeta\eta(1-\Theta)}$$

As α is lower than unity , the time series shown in 1.16 is a stationary process and stationary equilibrium is given by

$$\frac{\bar{\theta} - \Theta}{\Theta} = \Delta = -x^2\frac{1-\zeta(1-\eta) - \zeta\eta\Theta}{1+\zeta\eta[1-\Theta(1+x^2)]}$$

Appendix II.b:

First let us note that

$$\Theta(1+x) \preceq 1$$
$$\Theta \preceq \frac{1}{1+x} \overset{0 \preceq x \prec 1}{\Rightarrow} \Theta \prec \frac{1}{1+x^2} \Rightarrow \Theta(1+x^2) \prec 1$$

$$\frac{\partial \Delta}{\partial \zeta} \succeq 0 \text{ if only if}$$
$$\overset{\text{if and only if}}{\Leftrightarrow} \overbrace{[1-\eta(1-\Theta)]}^{\succeq 0}(1+\zeta\eta[1-\Theta(1+x^2)]) +$$
$$\overbrace{\eta[1-\Theta(1+x^2)][1-\zeta(1-\eta)]}^{\succeq 0} \succeq \zeta\eta\Theta\eta[1-\Theta(1+x^2)]$$
$$\overset{\text{if and only if}}{\Leftrightarrow} [1-\eta(1-\Theta)]\zeta\eta[1-\Theta(1+x^2)] \succeq \zeta\eta\Theta\eta[1-\Theta(1+x^2)]$$
$$\overset{\text{if and only if}}{\Leftrightarrow} [1-\eta+\Theta\eta]\zeta\eta[1-\Theta(1+x^2)] \succeq \zeta\eta\Theta\eta[1-\Theta(1+x^2)]$$
$$\overset{\text{if and only if}}{\Leftrightarrow} (1-\eta)\zeta\eta[1-\Theta(1+x^2)] \succeq 0$$

Collateral Regimes and Disconnection

2.1 Introduction

During the protests of the Arab Spring young people voiced their frustration with regimes that deprived them of political participation and economic opportunities. The protests were a potent symbol that the state-centered development model prevailing in the region had run its course. One of the distinct features of this model is a public sector that assumes the role as employer of first and last resort. Unlike in other world regions, public sector wages in MENA are actually higher than those in the private sector. This leads those who can afford to queue for a long time to obtain jobs with limited social returns. In the post-war period, some states issued employment guarantees for university graduates (World Bank (2004)).

The private sector suffers from a business environment that is characterized by wide-ranging microeconomic distortions, including form subsidies. In Egypt, for instance, fuel subsidies accounted for 6 percent of GDP during the fiscal year 2013/2014 (IMF (2015)). While certainly inefficient such distortions create their own constituency, making it politically costly for reform-minded governments to remove them. The bulk of rents this system produces, however, accrue to those at the top. Economic and business elites are closely linked, resulting in a business environment tilted in favour of politically connected firms. In Tunisia, for instance, 64 percent of politically connected firms operate in sectors subject to restrictions on FDI, compared to only 36 percent of non-connected firms (Schiffbauer et al. (2014)).

The opportunity costs of the prevailing systems have been laid bare by demographic trends. According to Malik and Awadallah (2013), between 1996 and 2006 the labour force in the MENA region has grown three times as fast as in the rest of the developing world. As a result close to 6 million new jobs each year were be

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required to absorb new labour market entrants (World Bank (2004)). Unfortunately, the economies in the region were able to generate only 3.2 million jobs per year during the 2000s, resulting in some of the highest youth unemployment rates in the world (World Bank (2011b)).

The poor labour market outcomes appear to have a financial dimension (World Bank (2011a)). While volumes of private credit are high compared to income peers, the region has some of the highest credit concentration ratios in the world, reflecting connections between large corporate and their banks. Therefore, favourable measures of financial depth do not necessarily translate into financial access for a broad cross-section of firms. Moreover, the institutional environment is not conducive to small business lending. According to Doing Business (World Bank (2016)), this applies especially to the secured transactions framework. Doing Business uses the Strength of Legal Rights Index to represent the quality of the secured transactions framework. As Table 2.16 shows no economy of the region scores above 2 out of 12 on the Strength of Legal Rights Index, compared to an average of 5 for middle-income-countries.

Most MENA countries have deficiencies in all components of the chain of secured lending (World Bank (2011a)). The types of movable assets that can be pledged as collateral are limited. Furthermore the priority of secured creditors is often unclear, which makes it difficult to assess the level of protection the collateral offers. The registration of collateral is often paper-based and fragmented. It is therefore difficult to obtain information on existing security rights. Last but not least, the enforcement of security rights is difficult, especially when it comes to enforcing out of court. Speedy enforcement is particularly important for movable assets, which in most cases depreciate over time.

The quality of the secured transaction regime matters, because in principle collateral can facilitate lending in a risky environment through three main channels. First, collateral reduces the risk faced by the bank as losses can be recovered through collateral in case of default. Second, collateral increases incentives for borrowers to repay given the possibility of losing the collateral. Third, collateral mitigates information asymmetries, as information on the quality of the collateral can substitute for borrower information.

However, collateralized lending also comes with its own problems, and the availability of collateral is one of them. On average 78 percent of the capital stock of an enterprise in the developing world typically consists of movable assets such as machinery, equipment or receivables (Love et al. (2013)). Immovable assets such as real estate, on the other hand, account for only 22 percent of the capital stock. If the secured transaction regime penalizes collateralization of movable assets, a large proportion of firms' capital stock remains unused. As a result an otherwise creditworthy borrower will be denied credit, with adverse implications for firm growth.

Second, collateral may tilt the allocation of credit away from firms whose growth prospects are particularly dependent on access to external finance. Hsieh and Klenow (2014) highlight the importance of the fast expansion of firms in early stages of their life cycle in an advanced economy (USA) compared to slow (Mexico) and no expansion (India) in developing economies. This implies that insufficient job creation could partly be explained by external factors that hamper the ability of firms to expand in the early stages of their life cycle.

The availability and cost of external finance is one of those factors.[2] When financial markets are complete and external finance perfectly substitutes for internal finance, firms follow their investment plan to expand regardless of the availability of internal funds. However, as the cost of external finance increases, firms may forego an investment opportunity unless they can finance it internally. Furthermore, the wedge between the cost of internal and external finance is even larger for firms in the early stages of their life cycle, as on average they are likely to be more opaque and to have fewer assets that can be pledged as collateral (Schiantarelli (1996) and Hubbart (1998)). As a result the expansion plans of young firms tend to be more sensitive to the availability of external finance ((Moscarini and Postel-Vinay, 2012) and Perez-Quiros and Timmermann (2000)).

In a related paper, Calvo et al. (2012) argue that jobless recoveries following financial crises can be explained by contraction in collateral values, which induces firms to choose more capital-intensive forms of production. Here, we examine whether this mechanism also applies outside recessionary episodes.

This paper draws on a novel dataset to investigate the effect of collateral regimes

[2]See Clementi and Hopenhayn (2006), Binks and Ennew (1996) and Oliveira and Fortunato (2006).

on the allocation of credit and firm performance. The Middle East and North Africa Enterprise Survey (MENA ES) is a new firm level dataset funded jointly by EBRD, EIB and the World Bank. The MENA ES provides representative samples of the formal private sector in eight MENA economies: Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, and Yemen. The methodology is compatible with World Bank Enterprise Survey fielded in other world regions including BEEPS. The survey addresses a broad range of business environment issues and includes a detailed set of questions measuring firms' ability to access finance.

EBRD et al. (2016) present first results from the MENA ES. They find that the region is characterized by an unusually high share of firms that state that they do not need a loan. This share is even higher in those economies with comparatively less advanced financial systems. Idiosyncratic variation in project timing and the macroeconomic environment alone cannot explain this phenomenon as a period of economic difficulty may actually increase demand for loans. EBRD et al. (2016) therefore argue that some of the firms that do not need a loan have actually disconnected from the banking sector in the sense that they have adapted production strategies to an environment where banks are not an option even if this comes at the cost of lower firm growth.

The central methodological issues that our empirical strategy needs to address are reverse causality and selection bias. For two reasons, a simple OLS regression of firm growth on the collateral associated with a loan will yield inconsistent estimates. First, it is not clear whether stringent collateral requirements lead firms to grow slower or whether banks require more collateral from slow growing firms. Both channels are plausible and both imply a negative association between collateral requirements, access to finance and employment growth. Second, the collateral requirements associated with a loan are only defined for firms that currently have a loan outstanding. Unfortunately, this does not apply to a significant share of our sample. Such a set-up is likely to understate the effects of collateral policies on employment as it does not take into account that firms can be denied credit because they cannot meet the collateral requirements, or that collateral demands discourage firms from applying in the first place.

To address these challenges we adopt a two-stage procedure. The first stage re-

covers each bank's collateral policy. The collateral policy of an individual bank is defined as the average conditional collateral requirement for all clients of that bank. It can be recovered through a regression of the collateral requirement on borrower characteristics and a bank-specific fixed effect. In a second stage, the estimated collateral policies are aggregated into collateral indices, reflecting market practices in the area where the firm is located. To this end we exploit location data to identify all bank branches that are located in a circle with a radius of 10km centred on each firm in the sample. By averaging the estimated collateral policies of all banks with branches in the circle we construct the collateral indices that represent the collateral practices in the vicinity of the firm. We construct two collateral indices in order to represent different aspects of the collateral environment. The first index tracks the ratio of collateral to loan value (the collateral ratio index), whereas the second measures the share of collateralized loans where either machinery and equipment or receivables were pledged as collateral (the movable collateral index). The collateral indices are then used to explain firms' employment growth.

We find that a favourable collateral regime increases employment growth. Lower collateral ratios as represented by the collateral ratio index benefit young firms only. This is consistent with the notion outlined above that young firms are more likely to face a collateral availability constraint. A greater willingness to accept movable collateral as measured by the movable collateral index benefits both young and old firms.

While we have little evidence to expect that the collateral indices are correlated with some unobservable feature of the environment that also affects firm growth, this cannot be ruled out. It is therefore important to show that the collateral environment affects firms' financial choices. In fact, we find that young firms are less likely to disconnect when faced with lower collateral ratios. At the same time they are more likely to have a loan or line of credit outstanding. Movable collateral also reduces firms' propensity to disconnect, though discouragement increases. While at first glance surprising, this pattern could be explained by the strong presence of manufacturing firms in the formal private sector of these economies. Machinery accounts for most of the movable assets pledged as collateral. Such collateral may bear greater resemblance to real estate than to receivables in that it is similarly

secure for the bank.

In sum, we provide evidence that the prevailing collateral regime affects firms' financial choices and therefore their employment growth. The evidence, however, is based on the growth patterns of existing firms. To the extent that a benign collateral environment facilitates firm entry our results underestimate the true effect of collateral on employment. Furthermore the evidence comes from variation in collateral practices permitted by a given institutional framework. The estimate may therefore underestimate the benefits from moving to a more modern secured transactions regime. As the Doing Business results suggest, there is ample scope to do so.

We proceed as follows. The next section describes the dataset we use. Section 3 discusses the measurement of credit constraints and the concept of banking sector disconnect. Section 4 presents our identification strategy and section 5 discusses our empirical results. Section 6 concludes.

2.2 Data

2.2.1 The MENA Enterprise Survey

The firm level data come from The Middle East and North Africa Enterprise Survey (MENA ES), funded jointly by EBRD, EIB and the World Bank. The MENA ES provides representative samples of the formal private sector in eight MENA economies: Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, and Yemen. The survey covers manufacturing and service firms with at least five employees, where services includes retail, wholesale, hospitality, repairs, construction, transport and information technology (IT) firms. Not covered by the survey are agriculture, fishing, and extractive industries, as well as utilities and some service sectors such as financial services, education, and healthcare.

The MENA ES addresses a broad range of business environment issues such as access to finance, the extent of corruption, the quality of infrastructure, the prevalence of crime, the intensity of competition, as well as performance measures. The samples are stratified by firm size, sector of activity, and location within the MENA economies. The survey covers 6083 firms in total with sample size ranging from 266

firms in Djibouti to 2897 in Egypt. The MENA ES follows the World Bank's global methodology for enterprise surveys. The data are therefore comparable with enterprise surveys in 126 countries covering more than 94,000 firms. EBRD et al. (2016) presents first results of the MENA ES.

Data collection took place in the aftermath of the Arab Spring. Respondents were interviewed in 2013 and 2014, but the reference period of the survey is firms' fiscal year 2012. Figure **??** illustrates that the data were collected during exceptional times. Respondents are asked to choose from a list of fifteen elements of the business environment the one that currently represents the greatest obstacle to their enterprise. In the MENA ES economies 32 percent of respondents name political instability as the top obstacle compared to only 9.7 percent in the rest of world.

2.2.2 Access to Finance

The MENA ES measures firm access to finance along various dimensions. In particular, respondents are asked whether they currently have a loan or line of credit outstanding. Figure **??** plots the proportion of firms with an outstanding loan or line of credit against private credit in percent of GDP. Data on private credit to GDP comes from the World Bank's Global Financial Development Database. Light grey and dark grey lines indicate averages for lower middle income and upper middle income economies.[3] The chart shows both measures to be correlated, though in some cases outcomes diverge. Lebanon, Morocco and Tunisia, compare well to income peers both in terms of financial access and financial depth. Conversely, Egypt, the West Bank and Gaza and Yemen lag behind their income peers, especially in terms of access. Jordan stands out in that a large volume of credit goes hand in hand with low prevalence of bank loans, while the opposite applies to Djibouti. in In any case, according to this metric access to finance does not appear as bad as suggested by earlier work World Bank (2011a).

The MENA ES in addition contains a set of questions that elicit the properties of these loans, which enables us to construct two measures representing collateral requirements. We first measure the collateral ratio, which is given by the ratio of collateral to loan value. To eliminate outliers, we winsorize the variable at the 5th

[3]Jordan, Lebanon, and Tunisia are upper-middle income countries; the others are lower-middle income.

and the 95th percentile of its distribution. We then construct a movable collateral indicator that equals one if the borrower pledged machinery and equipment or receivables to secure the loan. Figure **??** shows that the average collateral ratio in the MENA ES exceeds that of the average lower- and upper-middle income economy, but not dramatically so. The regional average masks considerable variation. For instance, average collateral ratios in Egypt and Yemen are twice that of Jordan and West Bank and Gaza.

To measure credit constraints we rely on a standard set of questions as used for instance in Popov and Udell (2010). The MENA ES first asks firms whether they have applied for a loan in the last fiscal year. Those who respond affirmatively are then asked whether the loan application was approved or rejected. Firms that did not apply for a loan are asked for the main reason they did not apply. Those firms that respond "no need for a loan" are classified as not credit constrained. Firms that cite other reasons such as complex application procedures, too high interest rates or collateral requirements, or simply did not believe that the application would be approved are considered credit constrained.

Figure **??** shows the percentage of unconstrained firms in the MENA ES broken down into firms that do not need a loan and firms with a successful loan application. EBRD et al. (2016) show that the MENA ES economies are characterized by a higher share of firms that are not credit constrained than any other region of the world. In most economies, the percentage of unconstrained firms is indeed high, accounting for 87% of enterprises in Djibouti and Morocco. However, the share of unconstrained firms is driven largely by those that do not need a loan rather than successful applications. This applies especially to the relatively shallow banking systems of Egypt, West Bank and Gaza, and Djibouti. Figure **??** presents the percentage of credit constrained firms broken down into firms with a rejected loan application and those that were discouraged from applying in the first place. The share of credit constrained firms primarily reflects discouraged firms. Rejected loan applications are rare across the board.

2.2.3 Employment growth and control variables

Employment growth is the economic outcome we seek to explain. We compute employment growth through expansion for all incumbent firms comparing the number of their full time employees at the end of last fiscal year and three fiscal years ago.

$$g_i = \frac{1}{t_{LFY} - t_{FY-3}} \frac{l_{LFY} - l_{FY-3}}{\alpha l_{LFY} + (1-\alpha) l_{FY-3}} \tag{2.17}$$

A common choice of weight is to set $\alpha = 1/2$. It has the advantage of making the growth measure symmetric and more comparable across different size groups(Moscarini and Postel-Vinay (2012)). By design the survey only covers firms that have survived until the interview. This implies that our results are subject to survivor bias in the sense that we cannot observe firms that have exited since $FY - 3$.

We construct a set of control variables that may plausibly affect the ability of the firm to either grow or attract external finance.

In particular, the MENA ES questionnaire includes three questions which provide information on gender, education and experience of the firm's manager. *Manager education* assume a value of 1 if the manager holds a university degree and 0 otherwise. University educated managers may find it easier to deal with banks and prepare the necessary documents to obtain a loan. *manager experience* captures how many years of experience the manager has in the present sector. *Female CEO* is a dummy variable that indicates whether the top manager is female. For instance, as a result of discrimination female entrepreneurs may face more difficult access to finance.

The MENA ES further provides information on the ownership of firms. The variable *Foreign ownership* is a dummy variable that takes the value of 1 if it at least 10 percent of the firm is owned by foreign private individual or company. Foreign-owned firms may have access to internal capital markets and therefore be less dependent on the local banking system. The questionnaire also elicits whether the firm is independent or part of a bigger establishment. The variable *Single firm or headquarter* is an indicator equal to one if the firm is a single-plant establishment or the headquarter of a multi-plant enterprise. Firms that do not fall in either of the categories may enjoy less financial autonomy are therefore be less likely to interact with banks.

Finally, we construct three measures of firm quality. *Audited* equals one if the firm's accounts have been certified by an external auditor. This reduces information asymmetries and thereby facilitates access to finance. *Exporter* is an indicator equal to one if the firms exports at least ten percent of sales. This signals that the firm is competitive in international markets. Finally, *Website* indicates if the firm uses the web in interaction with clients or suppliers, suggesting a comparatively high level of sophistication. Summary statistics are provided in Table REF. Some other studies such as Gorodnichenko and Schnitzer (2013) that use similar data (BEEPS) control in addition for total factor productivity, estimated based on cost shares for labour, material, and capital, adjusted for capacity utilization. Item non-response to quantitative questions in the MENA ES is high implying a large and likely non-random loss of observations, as a result of which we decide to not control for TFP.

In addition to the enterprise data from the MENA ES we use data on the location of bank branches. EBRD has shared with us on data on bank branches in Morocco, Tunisia, Egypt, and Jordan. We have in addition compiled data on the location of bank branches in Lebanon and West Bank and Gaza. Most banks in the region by now provide a list of branches on their websites.[4] Data on bank branches in Yemen is sparse and Djibouti hardly has spatial variation. The subsequent analysis therefore does not take these two economies into account.

2.3 Measuring credit constraints

For many years have economists attempted to measure firms' financial constraints. One stream of the literature focuses on inferring financial constraints from firms' financial characteristics. As there is no item on a balance sheet that can tell us whether a financial constraint is binding, economists have developed methodologies to infer it indirectly by relying on theories of optimal investment. In this setting external funds are perfect substitutes for internal resources. Investment therefore depends only on present and potential future investment opportunities and lack of internal resources is not a binding constraint per se. The investment opportunity can then be captured by Tobin's Q (Brainard and Tobin (1968) and Tobin (1969)).

[4]Branch addresses have been converted into coordinates using the geocode utility developed by Ozimek and Miles (2011).

The empirical evidence, however, indicates that firms' investment decisions significantly depend on the availability of internal resources even after controlling for Tobin's Q (Blundell et al. (1992)). The seminal paper by Fazzari et al. (1988) has been the first attempt to provide empirical support to interpreting the cash flow sensitivity of investment as a financial constraint. The results have been challenged and augmented by numerous studies such as (Kaplan and Zingales, 1997), (Kaplan and Zingales, 2000), Alti (2003) (Bushman et al., 2011) and Farre-Mensa and Ljungqvist (2015). For instance, Farre-Mensa and Ljungqvist (2015) show that firms classified as financially constrained by the five most common indirect measures do not have any difficulty obtaining credit when their demand for debt increases as a result of exogenous shocks such as tax increase.

Such findings motivate another line of research that tries to measure financial constraints directly form survey data on bank debt. This literature relies on the notion of financial constraints first developed by Stiglitz and Weiss (1981). They argue that financial markets are imperfect due to asymmetric information. Therefore, in equilibrium, credit is allocated by rationing rather than by price leading to excess credit demand. However (Kon and Storey, 2003) argue that in the presence of application cost some firms may decide not to apply for a loan in spite of their demand for external finance. They call this process of shutting out the credit market "self-rationing" and they call the firms concerned "discouraged borrowers". Popov and Udell (2010) observe that credit constraints more frequently assume the form of discouragement rather than rejected loan applications, a finding consistent with Figure **??**. Several studies provide evidence on the negative effects of binding credit constraints among discouraged firms or how they closely resemble rejected firms.[5]

As discussed above the MENA ES economies are characterized by an unusually high share of firms that are not credit constrained. Figure **??** suggests that this quantity is if anything weakly correlated with the prevalence of bank funding. Egypt and Lebanon, for instance, display a similar proportion of unconstrained firms despite their vastly different financial system characteristics. Considering the turmoil that the region is going through the high ratio of unconstrained firms is surprising.

[5]See Cole (2008) Berkowitz and White (2004) and Berger et al. (2011) for the United States, Brown et al. (2011) and Popov and Udell (2010) for Europe, and Chakravarty and Xiang (2013) for developing countries.

Decomposing the unconstrained firms into firms that do not need a loan and approved borrowers it turns out that the high ratio of unconstrained firms in MENA ES economies comes from the former group.

Egypt, West Bank and Gaza, and Yemen exhibit the highest share of firms that do not need a loan in their unconstrained firms. EBRD et al. (2016) show that these firms are less likely to view access to finance as a major concern, are less likely to have purchased fixed assets, and are less likely to plan an expansion. These findings also hold after accounting for standard set of firm characteristics.

Does the high share of firms that do not need a loan reflect a lack of investment opportunities? While plausible this perspective ignores that investment opportunities are to some extent endogenous. Financial constraints can lead firms to adjust their economic activity so as to reduce their reliance on external finance to a minimum. Financial constraints could therefore discourage firms from fast growing businesses that requires more investment and entail a greater dependence on external funds. In this case firms strategically choose to disconnect from financial sector and therefore they pursue activities that are less demanding in terms of investment. EBRD et al. (2016) call these firms *disconnected* and we label this type of self-rationing from credit markets *hidden discouragement*.

One could argue that this pattern of low demand reflects just idiosyncratic variation in investment timing and therefore does not reflect a disconnect from the banking system. However, Figure 2.22 indicates that disconnected firms are also less likely to use the banking system for payments purposes. The share of firms with a checking or savings account is lowest in Yemen, where only 48 percent of firms in the formal sector have a bank account, followed by Egypt and West Bank and Gaza. These economies also exhibit the highest share of disconnected firms as a proportion of the not credit constrained firms, which in all cases exceeds 90 percent. This pattern supports the notion that these firms are indeed opting out of the banking system.

2.4 Empirical strategy

This study examines the effect of collateral policies on employment growth. For two reasons, a simple regression of employment growth on collateral requirements

most likely yields inconsistent estimates. First, the collateral requirements associated with a loan are only defined for firms that currently have a loan outstanding. Unfortunately, this does not apply to a significant share of our sample. Such a set-up is likely to understate the effect of collateral policies on employment growth as it does not take into account that firms can be denied credit because they cannot meet the collateral requirements, or that collateral demands discourage firms from applying in the first place. Second, OLS estimates could be biased due to reverse causality. Do stringent collateral requirement lead firms to grow slower or do banks require more collateral from slow growing firms? Both channels are plausible and both imply a negative association between collateral requirements, access to finance and employment growth.

To address these challenges we adopt a two-stage procedure. The first stage recovers each bank's collateral policy. In a second stage, the estimated collateral policies are aggregated into collateral indices, reflecting market practice applied by banks in the area where the firm is located.

The first stage exploits information on the identity of the bank granting the last loan or line of credit. This information is not part of the publicly available micro data. It enables us to construct a dataset of borrowers and lenders. The collateral policy of an individual bank is then defined as the average conditional collateral requirement for all clients of that bank. It can be recovered through a regression of the collateral requirement on borrower characteristics and a bank-specific fixed effect. Borrower characteristics control for the idiosyncratic features of the client that may affect collateral demands. The bank-specific fixed effect then represents the collateral policy.

In the second stage we use the estimated collateral policies to obtain a representation of collateral practices at the local level. We use the geo-coordinates to identify all bank branches that located in a circle with a radius of 10km centred on each firm in the sample. Then by averaging the estimated collateral policies of all banks with branches in the circle we construct the collateral indices that represent the collateral practices prevailing in the vicinity of the firm. The indices are branch-weighted such that banks with a greater number of branches in the circle receive greater weight in the index. Banks that do not have any branches receive a weight

equal to zero.

In practice we construct two collateral indices in order to represent different aspects of the collateral environment. The first index tracks the ratio of collateral to loan value (the collateral ratio index), whereas the second measures the share of collateralized loans where either machinery and equipment or receivables were pledged as collateral (the movable collateral index). The collateral ratio index is given by the negative of the average collateral ratio assigned to the firm's local banking network. As it is the negative of the collateral value to the value of the loan, higher values imply lower collateral ratios. The movable collateral index is given by the share of bank branches willing to lend against movable collateral and varies between zero and one. Thus, if banks that are more likely to accept movable collateral have a larger share of branches close to the firm, this will be represented by a higher score of the corresponding movable collateral index.

While we have little evidence to expect that the collateral indices are correlated with some unobservable feature of the environment that also affects firm growth, this cannot be ruled out a priori. It is therefore important to show that collateral practices affects firms' financial choices. In particular, the analysis examines four potential channels through which collateral practices can shape firms' financial structure. First, EBRD et al. (2016) have shown that the region is characterized by an unusually high share of firms that do not need finance, which we view as a form of self-rationing. We therefore study whether collateral practices affect a firm's propensity to disconnect from the banking system. Second, Figure **??** shows that most credit constrained firms are discouraged from applying for a loan. We therefore also consider the effect on discouragement. Third, given that we know why a firm is discouraged and our hypothesis specifically relates to collateral, we implement an additional specification that looks at whether a firm is discouraged due to strict collateral requirements. Lastly, we examine whether more client-friendly collateral practices do indeed increase the probability to have a bank loan or line of credit.

2.5 Results

2.5.1 Estimating banks' collateral policies

We start our empirical analysis by estimating banks' collateral policies. Table 2.18 presents the results. The dependent variable in Column (1) is given by the value of collateral as a percentage of the loan amount. The dependent variable in Column (2) is a dummy variable equal to one when firms are allowed to pledge their movable assets as collateral and zero otherwise. As borrower characteristics may systematically affect the collateral banks demand, both specifications include our standard set of firm-level covariates. We saturate the model with sector and time fixed effects. The variables of interest are the bank-specific fixed effects as they pick-up banks' collateral policies.[6]

The F-statistics indicate that the bank specific characteristics are significant in defining our both collateral metrics. Borrower characteristics that affect the average collateral ratio are age and exporter status. Young firms and exporter exhibit on average lower ratios of collateral to loan value. Whether a firm can pledge movable assets appears less sensitive to firm characteristics. On the contrary, and most of variation in the intensity of movable collateral lending can be explained by lender-specific collateral policy. The small number of observations relative to the overall sample size of the MENA ES reflects the limited number of firms with a loan or line of credit outstanding.

2.5.2 Local collateral practice and employment growth

Table 2.19 shows how local collateral practice affects firms' ability to expand and create new jobs. The dependent variable in both columns is employment growth during the last three fiscal years. In addition to country and sector fixed effects, the specification includes the standard set of covariates. *collateral environment* is the explanatory variable of interest that represents collateral practices prevaling in the vicinity of the firm. This variable acts as a credit-supply shifter that can affect firms' employment growth through financial constraints. In Column (1), *collateral*

[6]We assign different fixed effects to same bank when it operates in different countries, but this applies only to a small number of banks - mainly Jordanian banks that also operate in West Bank and Gaza.

environment is given by the collateral ratio index, in Column (2) by the movable collateral index.

Column (1) of Table 2.19 shows that in line with the literature firms less than five years old exhibit on average faster employment growth. The interaction term between the age indicator and *collateral environment* is statistically significant. This shows that these firms grow even faster if they are located in areas where banks that demand less collateral have a stronger presence. The insignificant coefficient on *collateral environment* and the statistically significant coefficient for the interaction term confirm that the impact of local presence of banks with less stringent collateral policy is indeed limited to young firms. Older firms are less sensitive to this aspect of collateral policy.

Column (2) of Table 2.19 reports results for the movable collateral index. The regression suggests that firms' ability to expand increases if they are located in areas with a stronger presence of banks that are more likely to let firms pledge their movable assets as collateral. Moreover, in contrast to lower collateral ratios, the positive effect of lending against movable collateral applies to both young and old firms.

2.5.3 Financial channels

We argue that local collateral practice can affect firms' ability to create jobs through easing or tightening financial constraints. In this section we support our argument by directly relating collateral policies to financial constraints. Table 2.20 presents results on *collateral environment* as represented by the collateral ratio index.

In Column (1) we estimate the effect of *collateral environment* on firms' propensity to disconnect from the banking system. The collateral ratio index has no impact itself on the propensity to disconnect. Likewise, young firms do not differ from old firms. Interestingly, however, young firms do display a lower likelihood to disconnect when faced with a favorable collateral environment as reflected in the significant interaction term. Column (2) looks at discouragement and it turns out that there is no effect of the collateral ratio index on discouragement. Next, Column (3) examines a specific cause for discouragement, namely discouragement due to high demands for collateral. Both *collateral environment* and the interaction term have a negative sign, but are not statistically significant individually. They are however

jointly significant. Column (4) goes one step further and reports results for impact of *collateral environment* on firms' propensity to have a loan or a line of credit. In line with the results in Column (1) young firms are more likely to have a loan when they benefit from a benign collateral environment.

Table 2.21 presents the corresponding results for movable collateral. Column (1) shows that when the local banking system is more conducive to firms pledging movable assets as collateral, the firms are less likely to disconnect. The results in Column (2) on the other hand indicate that firms are more likely to report that they were discouraged from applying for a loan. According to the results in Column (4) a stronger presence of banks that are willing to lend against movable collateral does not translate into a higher prevalence of loans. Though one can argue that discouraged firms are closer to the financial system than disconnected firms in the sense that they do desire external finance the evidence remains inconclusive.

Nevertheless, the results matter in three ways. First, the impact of local collateral practices on financial constraints is consistent with the impact on employment growth - this applies at least to the collateral ratio index. Second, we observe that the local collateral environment affects firms' financial constraints through a shift in the supply of credit, which is captured by a change in the propensity of firms to have a credit line. Third, the collateral environment also affects their decision to adjust their activity and ultimately job creation according to the degree of financial constraints they face. This is reflected in reduced credit demand through firms' propensity to disconnect from the banking system.

2.5.4 Robustness checks

In the aftermath of the Arab Spring, the MENA ES economies have gone through a period of high political instability. As shown in Figure **??** MENA stands out for the highest proportion of firms that rank political instability as the top obstacle (32 percent) compared with their comparators in the rest of the developing world (10 percent). Even in Sub Saharan Africa only 18 percent of firms choose political instability as the top obstacle to their enterprise. It could be therefore be argued that our results are driven by regional political instability that acts as omitted variable and affects both employment growth and the collateral practices of banks operating

in the region.

Including the firm level political instability index, We reestimate the regression specifications for Employment Growth, Disconnection and Credit in Table 2.22. We construct a *Political Instability* index which is a dummy variable equal to one when firms declare political instability as a *major* or *very severe* obstacle for their enterprise and zero otherwise. The results indicate that all our main findings hold after controlling for political instability.

The MENA ES firm identifier does not necessarily correspond to an independent economic unit. Fortunately, the MENA ES provide us with information that enables us to determine whether a plant belongs to a company that is headquartered elsewhere. The financial states of these plants are less likely to be sensitive to their local banking system as they are financially connected to their headquarter, which could be located in a region with a very different collateral environment. To rule out this caveat we re-estimate our regressions on the subsample of single-plant firms as well as the headquarters of multi-plant companies. Table 2.23 has the results, which are consistent with the baseline.

2.6 Concluding Remarks

Drawing on a novel firm-level dataset, this paper provides evidence that a favourable collateral regime can increase employment growth. Lower collateral ratios index benefit young firms only. This is consistent with the notion that young firms are more likely to face a collateral availability constraint. A greater willingness to accept movable collateral benefits both young and old firms. While we have little reason to expect that the collateral indices are correlated with some unobservable feature of the environment that also affects firms growth, this cannot be ruled out a priori. It is therefore important to show that the collateral environment affects firms' financial choices. In fact, we find that young firms are less likely to disconnect when faced with lower collateral ratios. At the same time they are more likely to have a loan or line of credit outstanding. Movable collateral also reduces firms' propensity to disconnect, though discouragement increases. As the estimates exploit variation in collateral practices permitted by a given institutional framework our estimates may underestimate the benefits from moving to a more modern se-

cured transactions regime.

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Appendix

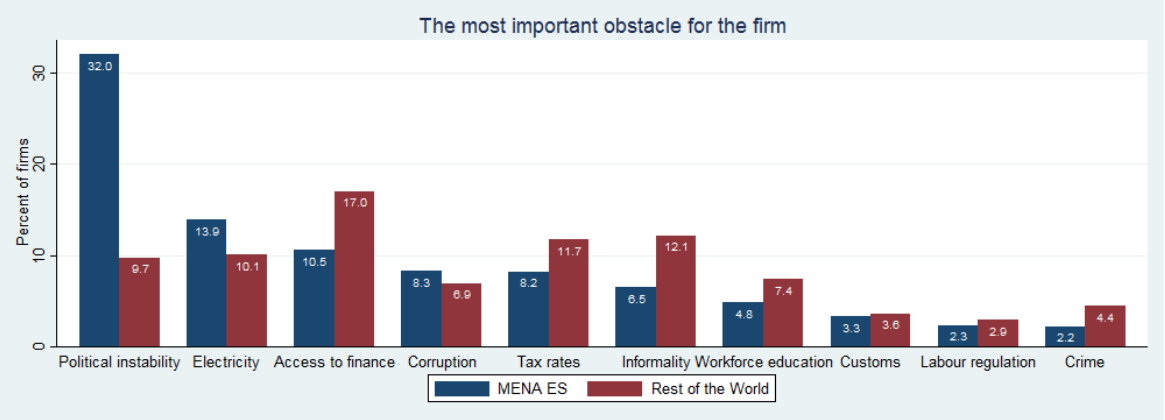


Figure 2.17: The most important obstacle to the firm

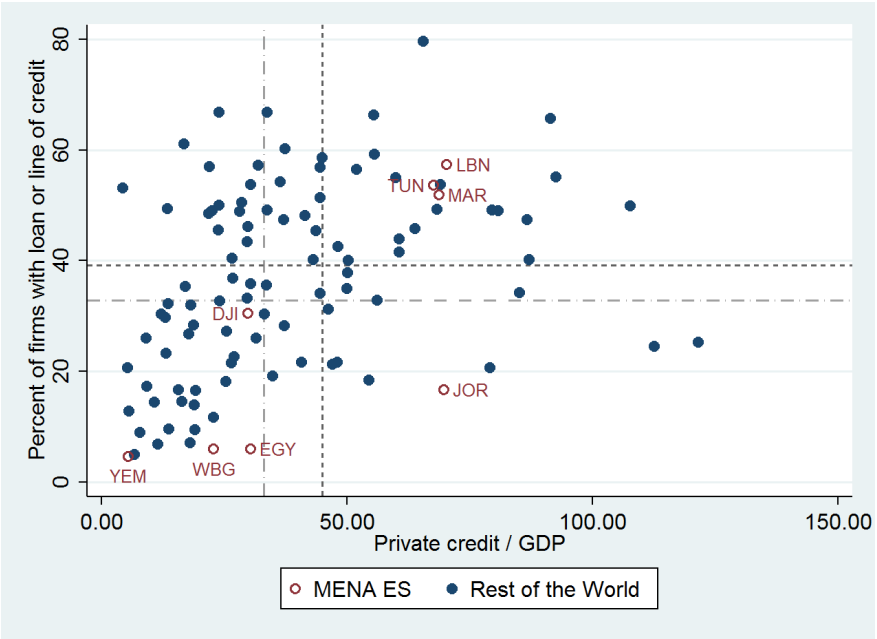


Figure 2.18: Percent of firms with a loan or line of credit and private credit to GDP.[7]

[7]Data on private credit to GDP comes from the World Bank's Global Financial Development Database. Light grey and dark grey lines show averages for lower middle income and upper middle income economies.

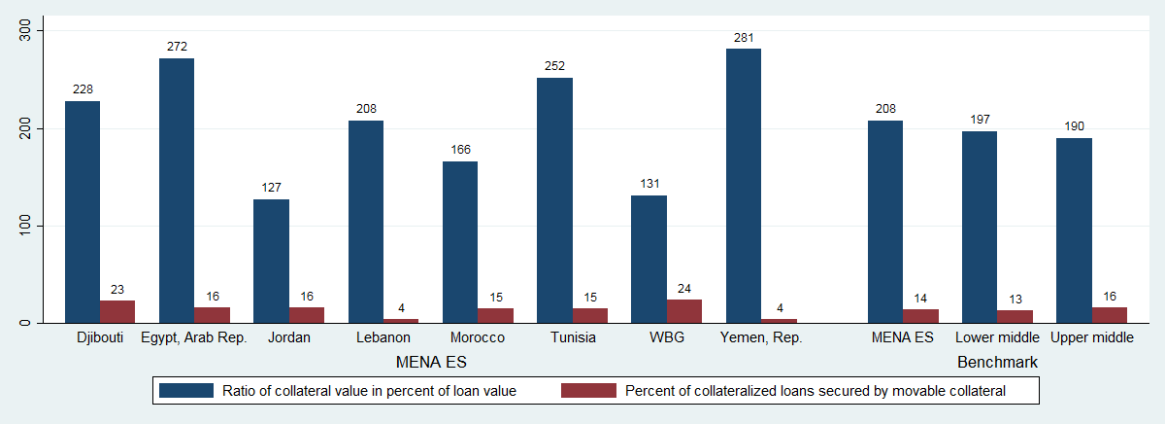


Figure 2.19: Collateral requirements in MENA ES economies and income peers

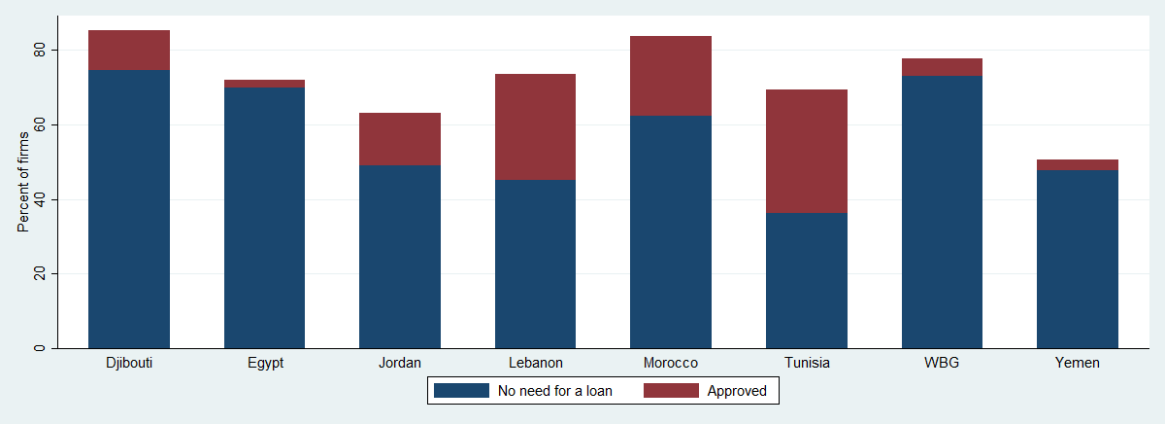


Figure 2.20: Percent of firms that are not credit constrained and breakdown into firms that do not need a loan and those with successful loan applications

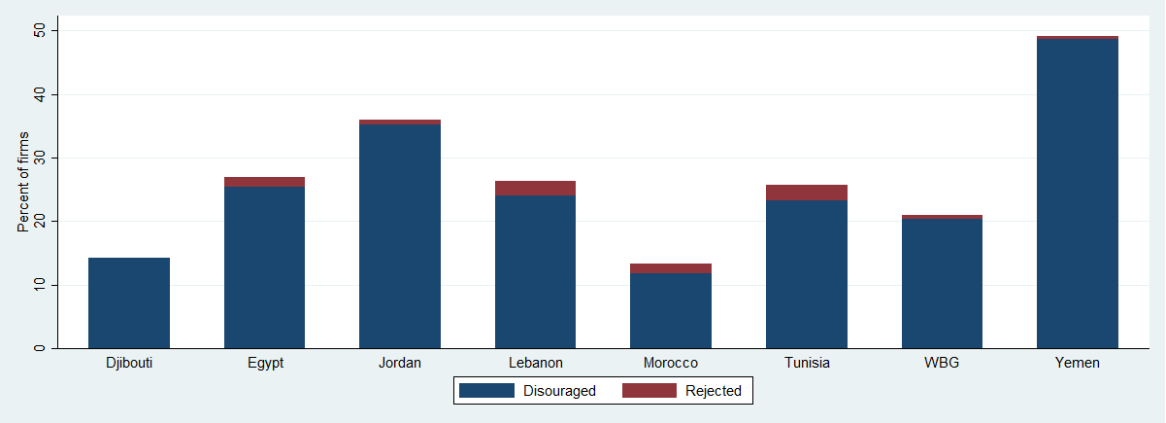


Figure 2.21: Percent of firms that are credit constrained and breakdown into firms that are discouraged and those with rejected loan applications

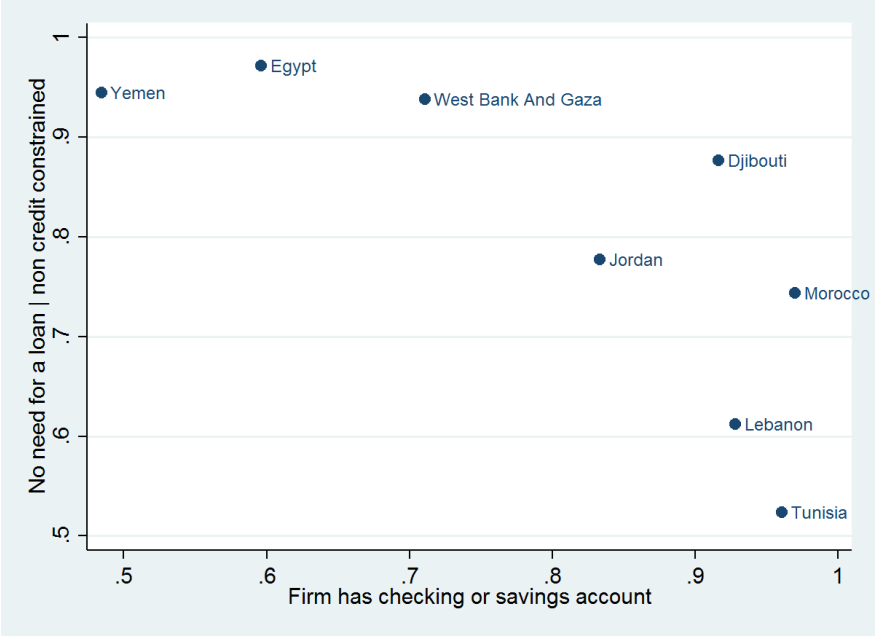


Figure 2.22: Disconnect from the banking sector concerns both credit and the use of payment services

Table 2.16: Doing Business: getting credit

Economy	Getting credit rank	Strength of legal rights index (0-12)	Depth of credit information index (0-8)
Djibouti	181	1	0
Egypt, Arab Rep.	79	2	8
Jordan	185	0	0
Lebanon	109	2	6
Morocco	109	2	6
Tunisia	126	2	5
West Bank and Gaza	109	0	8
Yemen, Rep.	185	0	0
MENA ES	135	1.1	4.1
Lower middle income	89	5.2	4.3
Upper middle income	82	5.3	4.8
High income: nonOECD	91	4.6	4.7
High income: OECD	55	5.8	6.5

Table 2.17: Summary statistics

	Employment Growth		Sectoral Composition		Age and Size		Manager Characteristics		
	(1) All firms	(2) Younger than 5 years	(3) Manu-facturing	(4) Retail	(5) Younger than 5 years	(6) SME	(7) University degree	(8) Experience in years	(9) Female CEO
Morocco	0.167	0.497	0.380	0.090	0.087	0.882	0.780	22.388	0.043
Jordan	0.118	0.197	0.446	0.149	0.177	0.937	0.615	17.738	0.024
Egypt	-0.039	0.040	0.551	0.156	0.330	0.932	0.799	18.354	0.071
Lebanon	0.067	0.422	0.268	0.263	0.135	0.938	0.721	27.552	0.044
Tunisia	0.021	0.250	0.422	0.057	0.102	0.888	0.704	24.574	0.085
West Bank and Gaza	0.226	0.326	0.494	0.195	0.224	0.995	0.404	17.877	0.012

	Firm Organization			Firm Quality				
	(10) Foreign owned	(11) Multi-plant firm	(12) HQ	(13) Audited accounts	(14) Exporter	(15) Website	(16) Political instability	(17) Number of firms
Morocco	0.120	0.142	0.126	0.473	0.119	0.694	0.313	407
Jordan	0.051	0.103	0.073	0.544	0.250	0.452	0.193	573
Egypt	0.072	0.135	0.101	0.690	0.074	0.353	0.770	2897
Lebanon	0.029	0.154	0.135	0.844	0.318	0.640	0.906	561
Tunisia	0.117	0.061	0.044	0.745	0.302	0.663	0.593	592
West Bank and Gaza	0.021	0.147	0.107	0.575	0.224	0.309	0.740	434

Note: The Table presents statistics on employment growth, employment growth of young firms, sectoral composition between manufacturing, retail and services, share of firms younger than 5 years old, share of SMEs (firms which have less than 100 permanent employees), share of firms whose manager has a university degree, average experience of the manager, share of firms with female CEO, share of firms which more than 10% of them owned by private foreign individuals, companies or organizations, share of firms that are part of larger multiplant establishment, share of firms that are Head Quarter (HQ) of multiplant establishment, share of audited firms, share of firms that exports, share of firms that use web services to communicate with clients and suppliers, share of firms that declare political instability is "Major" or "very severe" obstacle and total number of firms by country.

Table 2.18: First stage regression

Dependent Variable	(1) Value of collateral (% of the loan amount)	(2) Movable Collateral If they are allowed Y=1
younger than 5 years	-40.950**	0.071
	(20.54)	(0.06)
sme	8.728	-0.049
	(14.53)	(0.04)
exporter	-29.226**	-0.009
	(14.75)	(0.04)
female CEO	-20.589	-0.006
	(27.41)	(0.07)
audit	-19.411	0.076*
	(17.25)	(0.04)
manager with university degree	-14.312	0.073*
	(14.83)	(0.04)
manager's experience	-0.573	-0.000
	(0.55)	(0.00)
foreign ownership	-32.065	0.115*
	(23.01)	(0.06)
Constant	242.874***	0.688***
	(67.56)	(0.19)
Time	Yes	Yes
Sectors	Yes	Yes
Banks Fixed Effects	Yes	Yes
σu	84.328	.362
σe	133.538	.449
ρ (fraction of variance due to u_i)	.285	.393
F test that all $u_i = 0$:	$F(66, 476) = 1.37$ $Prob > F = 0.034$	$F(81, 756) = 2.49$ $Prob > F = 0.000$
Observations	568	863

*Note: OLS regression in column (1) and Probit regression in column (2) based on survey-weighted observations (Stata's svy prefix). Both regressions are estimated on the subsample of firms with a loan or line of credit. The dependent variable in column (1) is value Of collateral required for the most recent loan measured as a percentage of the loan amount. The dependent variable in column (2) is a dummy variable takes value 1 when movable collateral (machinery and receivable accounts) are accepted by bank, and firms did not pledge any real estate or personal assets beside these movables. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 2.19: Local collateral practices and employment growth

Dependent variable:	Collateral Environment based on	
Employment Growth	(1) Collateral Ratio Index b/se	(2) Movable Collateral Index b/se
Collateral Environment	-0.001	0.792**
	(0.00)	(0.38)
0-5 years	0.135**	0.130**
	(0.05)	(0.05)
0-5 years × Collateral Environment	0.013**	
	(0.01)	
Initial size (Log)	-0.112***	-0.111***
	(0.01)	(0.01)
exporter	0.049	0.049
	(0.03)	(0.03)
female CEO	-0.088	-0.084
	(0.05)	(0.05)
audit	0.042	0.044
	(0.03)	(0.03)
manager with university degree	0.032	0.031
	(0.03)	(0.03)
manager's experience	-0.004***	-0.004***
	(0.00)	(0.00)
Firm is part of a larger firm	0.043	0.042
	(0.04)	(0.04)
foreign ownership	0.039	0.033
	(0.04)	(0.04)
Website	0.048	0.049*
	(0.03)	(0.03)
Constant	0.463***	0.468***
	(0.06)	(0.06)
Countries	Yes	Yes
Sectors	Yes	Yes
Observations	4256	4256

*Note: OLS regressions in these two columns using survey-weighted observations (Stata's svy prefix). The dependent variable In column (1) is a dummy variable takes value 1 "Collateral Environment" has been constructed based on a branch-weighted average of the collateral ratio policies of banks that have branches in a circle with radius 10km centered on the sample firm. Similarly, in column (2) "Collateral Environment" has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 2.20: Local collateral practices as represented by the collateral ratio index and firms' financial choices

	(1) Disconnected	(2) Discouraged	(3) Discouraged due to high collateral requirements	(4) Firm has a loan
	b/se	b/se	b/se	b/se
Collateral Environment	0.011	-0.002	-0.017	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)
0-5 years	-0.125	0.129	0.157	-0.252
	(0.12)	(0.13)	(0.25)	(0.16)
0-5 years × Collateral Environment	-0.029**	0.004	-0.013	0.036*
	(0.01)	(0.01)	(0.02)	(0.02)
sme	0.131	0.481***	0.716**	-0.534***
	(0.12)	(0.17)	(0.28)	(0.14)
exporter	-0.007	0.161	0.074	-0.005
	(0.11)	(0.13)	(0.22)	(0.12)
female CEO	-0.107	0.119	-0.497	0.012
	(0.19)	(0.21)	(0.44)	(0.20)
audit	-0.069	-0.222**	-0.369**	0.464***
	(0.10)	(0.11)	(0.18)	(0.12)
manager with university degree	0.068	-0.208*	-0.271	0.186
	(0.10)	(0.11)	(0.17)	(0.12)
manager's experience	0.005	-0.004	-0.002	0.004
	(0.00)	(0.00)	(0.01)	(0.00)
Firm is part of a larger firm	-0.189	0.104	0.357	0.171
	(0.13)	(0.13)	(0.31)	(0.15)
foreign ownership	0.214	-0.146	0.012	-0.338**
	(0.15)	(0.19)	(0.25)	(0.17)
Website	0.081	-0.151	0.204	0.001
	(0.10)	(0.11)	(0.18)	(0.11)
Constant	0.469**	-1.170***	-2.656***	-1.502***
	(0.22)	(0.26)	(0.39)	(0.26)
Countries	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes
Observations	4855	4855	4855	4723

*Note: Probit regressions in all columns using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1) is a dummy variable takes value 1 if firm states that it does not need a loan. The dependent variable in column (2) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (3) is a dummy variable takes value 1 if firm does not apply for a loan due to high collateral requirements. The dependent variable in column (4) is a dummy variable takes value 1 if firm has a loan. "collateral environment " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 2.18.. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 2.21: Local collateral practices as represented by the movable collateral index and firms' financial choices

	(1) Disconnected	(2) Discouraged	(3) Discouraged due to high collateral requirements	(4) Firm has a loan
	b/se	b/se	b/se	b/se
Collateral Environment	-3.147**	4.609***	-0.578	-1.328
	(1.47)	(1.68)	(2.26)	(2.08)
younger than 5 years	-0.099	0.116	0.186	-0.236
	(0.12)	(0.13)	(0.24)	(0.16)
sme	0.122	0.490***	0.689**	-0.534***
	(0.12)	(0.17)	(0.28)	(0.14)
exporter	-0.004	0.162	0.056	-0.004
	(0.11)	(0.13)	(0.22)	(0.12)
female CEO	-0.120	0.125	-0.506	0.010
	(0.19)	(0.21)	(0.44)	(0.20)
audit	-0.085	-0.204*	-0.376**	0.458***
	(0.10)	(0.11)	(0.18)	(0.12)
manager with university degree	0.072	-0.214*	-0.271	0.179
	(0.10)	(0.11)	(0.17)	(0.11)
manager's experience	0.006	-0.004	-0.002	0.004
	(0.00)	(0.00)	(0.01)	(0.00)
Firm is part of a larger firm	-0.179	0.099	0.343	0.177
	(0.13)	(0.14)	(0.31)	(0.15)
foreign ownership	0.227	-0.169	0.050	-0.343**
	(0.15)	(0.19)	(0.23)	(0.17)
Website	0.083	-0.151	0.194	0.010
	(0.10)	(0.11)	(0.18)	(0.11)
Constant	0.458**	-1.190***	-2.511***	-1.486***
	(0.22)	(0.26)	(0.39)	(0.27)
Countries	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes
Observations	4855	4855	4855	4723

*Note: Probit regressions in all columns using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1) is a dummy variable takes value 1 if firm states that it does not need a loan. The dependent variable in column (2) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (3) is a dummy variable takes value 1 if firm does not apply for a loan due to high collateral requirements. The dependent variable in column (4) is a dummy variable takes value 1 if firm has a loan. "collateral environment " has been constructed based on a branch-weighted average of the collateral ratio policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policy is estimated as bank-specific effects in the fixed effect regression reported in Table 2.18. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 2.22: Employment growth, financial constraints, and political instability

	Collateral Environment based on Collateral Ratio Index				
	(1) Employment growth	(2) Disconnected	(3) Discouraged	(4) Discouraged due to high collateral requirements	(5) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-0.001	0.011	-0.002	-0.017	-0.003
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
0-5 years	0.130**	-0.139	0.132	0.164	-0.242
	(0.05)	(0.12)	(0.13)	(0.25)	(0.16)
0-5 years × Collateral Environment	0.013***	-0.029**	0.004	-0.014	0.034*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Political Instability Index	-0.042	-0.171*	0.043	0.117	0.138
	(0.03)	(0.10)	(0.11)	(0.15)	(0.11)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4256	4855	4855	4855	4723

	Collateral Environment based on Movable Collateral Index				
	(6) Employment growth	(7) Disconnected	(8) Discouraged	(9) Discouraged due to high collateral requirements	(10) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	0.803**	-3.046**	4.589***	-0.633	-1.393
	(0.37)	(1.48)	(1.68)	(2.26)	(2.07)
0-5 years	0.125**	-0.113	0.118	0.193	-0.226
	(0.05)	(0.12)	(0.13)	(0.24)	(0.16)
Political Instability Index	-0.039	-0.165*	0.029	0.106	0.149
	(0.03)	(0.10)	(0.11)	(0.15)	(0.11)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4256	4855	4855	4855	4723

*Note: All regressions are using survey-weighted observations (Stata's svy prefix). Political instability Index is a dummy variable takes value 1 if firm declares that political instability is "Major" or "very severe" obstacle and takes value 0 otherwise. In columns (1) control variables included but not reported include initial size (log), manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. In all other columns (2 to 5), control variables that are included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 2.23: Employment growth, and financial constraints in the subsample of single firms and headquarters of multi-plant firms

	Collateral Environment based on Collateral Ratio Index				
	(1) Employment growth	(2) Disconnected	(3) Discouraged	(4) Discouraged due to high collateral requirements	(5) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-0.001	0.011	-0.001	-0.018	-0.003
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
0-5 years	0.138***	-0.134	0.134	0.168	-0.225
	(0.05)	(0.12)	(0.12)	(0.25)	(0.15)
0-5 years × Collateral Environment	0.012**	-0.029**	0.004	-0.011	0.036*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4054	4625	4625	4625	4507

	Collateral Environment based on Collateral Ratio Index				
	(6) Employment growth	(7) Disconnected	(8) Discouraged	(9) Discouraged due to high collateral requirements	(10) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	0.871**	-3.439**	4.839***	-0.227	-1.517
	(0.37)	(1.49)	(1.71)	(2.20)	(2.13)
0-5 years	0.136**	-0.110	0.123	0.185	-0.208
	(0.05)	(0.12)	(0.12)	(0.24)	(0.16)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4054	4625	4625	4625	4507

*Note: All regressions are using survey-weighted observations (Stata's svy prefix). and have been conducted on the subsample of single Firms and HQ of multiplant firms.In columns (4) and (9) dependent variable is a dummy takes value 1 if firm does not apply due to high collateral requirements. In columns (1) and (6) Other control variables included but not reported include initial size (log), manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. In all other columns (2 to 5 and 7 to 10), control variables that are included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Structural Change and the China Syndrome

3.1 Introduction

The decline of the share of manufacturing in total GDP and in total employment has become a key concern for policymakers in advanced economies. In the public debate, one of the main causes for such deindustrialization is identified in the surge of imports from emerging economies, China in primis. The relevance of the import channel is contrasted with the effect due to fast productivity growth in manufacturing relative to services. The issue, especially in connection with the US experience, has attracted a rapidly growing attention in academic analyses as well.

Autor et al. (2013) study the impact of exposure to Chinese imports on local labor markets in the US. Similarly, Acemoglu et al. (2016) and Pierce and Schott (2012) analyze the effects of import penetration from China on US manufacturing employment, while Bloom et al. (2016) analyze the impact of pressure from Chinese imports on innovation by US firms. According to this literature, the growing exposure to Chinese imports exerted significant effects on employment and innovation in US firms.

In this paper, we use the exposure to Chinese imports as a way to identify a more general effect of international trade on structural change, defined as the process of relative dynamics across different macro-sectors of the economy. As our focus is on advanced economies, we concentrate on the relative dynamics of manufacturing versus services. The main objective of the paper is to identify and quantify the relative importance of the trade channel in explaining the reduction of the share in employment (and in value added) of manufacturing sectors in OECD countries during the period

1990-2007, prior to the global financial crisis.[8]

Traditionally, the literature on structural change has been overwhelmingly based on closed-economy models.[9] There are a few notable exceptions that emphasize the relevance of exposure to trade on structural change, such as Matsuyama (2009) and Uy et al. (2013) . In the traditional closed economy model, deindustrialization generally arises because of a faster growth in productivity in manufacturing relative to services (the well known Baumol effect[10]) and because of non-homothetic preferences , which imply that demand shifts towards services as incomes increase.[11] As shown by Matsuyama (2009), in an interdependent world with free trade, deindustrialization might be stronger for high income countries, as not only labor shifts from home manufacturing to services (which we define as the Baumol effect), but also labor shifts from home manufacturing to manufacturing industries in emerging countries, which are catching up in productivity with richer countries (we define this as the trade effect). Both effects operate through a price channel. While the Baumol effect acts through the relative price of manufacturing goods versus the little substitutable services, the trade effect acts through the relative prices of manufacturing in advanced countries versus the highly substitutable goods produced in emerging countries. In the literature on structural change, two main forces have been stressed: the income effect and the relative price mechanism. Income effects are derived by assuming non-homothetic preferences, which give rise to an increase in the share of total demand directed towards services. The relative price mechanism is induced by differential growth rates in productivity in manufacturing versus service sectors. This unbalanced productivity growth is associated with the shift of resources from manufacturing to services, as emphasized in Ngai and Pissarides (2007). As the focus of our paper is on international trade, we follow Ngai and Pissarides (2007) and assume homothetic preferences and unbalanced productivity growth in manufacturing relative to service sectors. Interestingly, Herrendorf et al. (2013) show that if one focuses on value added (instead of final

[8]The choice of excluding the period covering the global financial crisis is partly due to considerations of data availability. However, it is likely that specific financial factors operated during the financial crisis, and these may complicate the identification of the structural factors that are the focus of the paper.

[9]See the survey by Herrendorf et al. (2014).

[10]This was first proposed byBaumol (1967) and it is also known as the cost disease (see Imbs (2014)).

[11]See (Kongsamut et al., 2001) , Gollin et al. (2002) and Foellmi and Zweimüller (2008).

expenditure), such assumption is consistent with the main stylized facts on structural change.

Assuming homothetic preferences and low substitutability between manufacturing goods and services, the Baumol effect induces deindustrialization as measured by employment shares but not by value added shares. By contrast, the trade effect induces deindustrialization in both employment and value added. This is a crucial empirical implication that we exploit in the paper.

The relevance of the trade effect for the deindustrialization process in advanced economies, in particular the impact of the exposure to low income countries, was dismissed in the older trade literature. One main reason was that the share of low income countries in the imports of high-income countries was small until the beginning of the 1990s Krugman (2000). In 1991, low-income countries accounted for just 9 percent of US manufacturing imports. However, the situation markedly changed during the 1990s and even more during the 2000s. In 2000 the share of low-income countries in total US imports had increased to 15 percent, to then climb to 28 percent in 2007. Among low income countries, China alone accounted for nearly 90 percent of this growth. [12]

A similar pattern can be observed for other high income countries, which also experienced an increased exposure of their domestic industries to the fast growing Chinese manufacturing. [13]

Although the exposure of industries in advanced economies to imports from China continuously increased in the last three decades, there was a clear acceleration in the 2000s, following the entry of China in the WTO. Furthermore, following the entry in the WTO, Chinese exports experienced a significant change in their structure, with a jump in the share of ICT exports in total exports. Therefore, competition from Chinese exports is not limited to traditional sectors, but it involves as well more technologically

[12] Autor et al. (2013).

[13] China experienced a spectacular productivity growth through sweeping economic reforms initiated in the 1980s and extended in the 1990s Hsieh and Ossa (2016). These resulted in rural to urban migration flows in excess of 150 million workers Li et al. (2012), and massive capital accumulation Brandt et al. (2012).

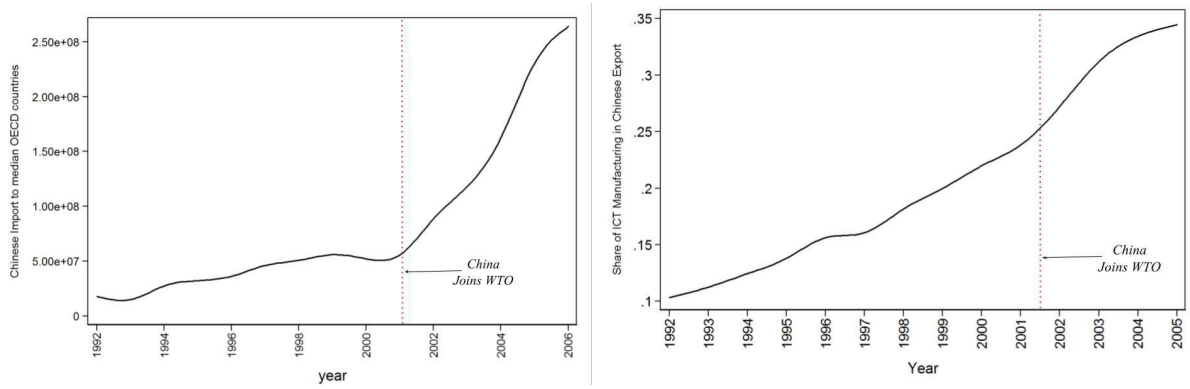
advanced sectors.

The main novel contribution of the paper is that we use the above two stylized facts as instruments for the identification of the trade effect on structural change in OECD countries. Indeed, we implement a difference-in-difference approach, analyzing post-versus-pre WTO entry periods and the exposure to Chinese imports in ICT vs non-ICT sectors. Our results indicate that indeed exposure to competition from Chinese exports significantly affected employment in OECD countries. Furthermore, such effect is stronger for ICT industries. Comparing results for employment and value added shares, we find that the trade channel was significant, as the more exposed industries experienced a fall in their share in both employment and value added.

The rest of the paper is structured as follows. Section 2 illustrates the main stylized facts associated to the growing exposure to Chinese imports of industries in OECD countries and the potentially related process of structural change taking place in those countries. In section 3, we present a simple model that serves to highlight the main channels affecting structural change, namely the socalled Baumol effect, occurring as well in a closed economy, and the trade effect. In section 4, we illustrate the characteristics of the dataset and the construction of our index for import exposure. Furthermore, we describe our empirical methodology and the strategy adopted for identifying the trade effect. Section 5 presents our main empirical results. Section 6 contains some concluding remarks.

3.2 Exposure to Imports from China and Structural Change in OECD Countries: Stylized Facts

Figure 3.23(a) illustrates the acceleration of the exposure to Chinese imports after China joined the WTO in 2001. Chinese imports in the median OECD country increased almost five times from 2001 to 2007. Moreover, a fact scarcely noticed, the structure of Chinese exports significantly changed over time, with the gradual specialization of China in ICT manufacturing exports.

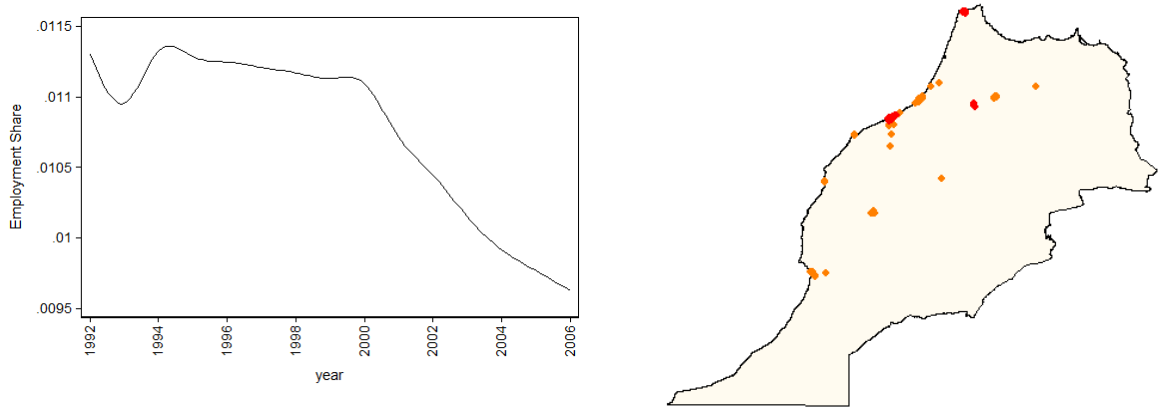


(a) Chinese Import Exposure in OECD

(b) Share of ICT in Chinese export

Figure 3.23

Figure 3.23(b) indicates that the share of ICT manufacturing increased from the early 1990s to the 2000s . More important, this trade specialization in ICT manufacturing sharply accelerated after 2001, with the share of ICT in total Chinese exports reaching almost 35%.



(a) Employment Share of Average Manufacturing Sector in OECD

(b) Difference in Employment Share , Average ICT vs Average Non ICT

Figure 3.24

The two stylized facts about the magnitude and the product concentration of the exposure to Chinese imports mirror two stylized facts about the magnitude and characteristics of structural change. Figure 3.24 (a) indicates that the pace of the decline of the share of manufacturing in total employment is markedly faster during the 2000s compared with the 1990s. Interestingly, such an acceleration in the fall in the employment share of manufacturing is associated with a deeper fall in the share of employment in ICT sectors (here identified in Electrical/Optical industries). Figure 3.24 (b) indicates the difference between the employment share of ICT and non-ICT sectors in

OECD countries during the period 1992- 2007. The relative share of ICT to Non-ICT sectors steadily increased during the 1990s. However, this pattern was reversed after 2001.

This stylized fact is useful to understand the process of deindustrialization in OECD countries during the 2000s, and, in particular, it sheds light on the determinants of the acceleration of such deindustrialization since the beginning of the 2000s. During the 1990s, employment in the ICT sectors contracted much less than the average manufacturing sector in OECD countries and this helped reducing the overall deindustrialization during that decade. By contrast, during the 2000s the sectoral distribution of structural change in OECD countries dramatically changed.

Employment in the ICT sectors dropped at a rate much faster than in the other sectors, significantly contributing to the acceleration in the process of deindustrialization that occurred during the years 2000s.

The overall acceleration of deindustrialization during the 2000s and the differential pattern of sectoral structural change in ICT vs Non-ICT industries in OECD countries suggest the potential role of international trade, through the drastic increase in import exposure to fast growing Chinese manufacturing and through an increasing exposure to Chinese exports in ICT manufacturing sectors.

We investigate this question by dividing sectors according to the increase in their import exposure from the 1990s to the 2000s. We compare the sectoral structural change of those country-industry pairs that have been experiencing the higher increase in their Chinese import exposure with those industries that have experienced a lower increase in their exposure. Moreover, dividing our sample into ICT and Non-ICT sectors, we aim to better identify the potential role of the trade effect on structural change, as the growth in the exposure to Chinese imports during the 2000s took place in ICT sectors. In the next section, we present a highly simplified model of structural change in an open economy, with the goal of identifying in the sharpest way the hypotheses we wish to verify in the empirical analysis.

3.3 A Simple Model

We consider a small open economy comprising two sectors, manufacturing and services. For simplicity, we assume that manufacturing goods are tradable, whereas services are not tradable. There is a continuum of identical consumers whose mass is normalized to one. Each individual consumer inelastically supplies labor to the firms, and, as the owner of the firms, collects the firms' profits. The consumer consumes services and manufactured goods, which consist of bundles of different varieties of domestic and foreign products. The consumer chooses consumption of the foreign/domestic manufacturing goods and services to maximize utility

$$U = [(1-\gamma)^{\frac{1}{\theta}} c_s^{\frac{\theta-1}{\theta}} + \gamma^{\frac{1}{\theta}} (\gamma'^{\frac{1}{\nu}} c_{m_h}^{\frac{\nu-1}{\nu}} + (1-\gamma')^{\frac{1}{\nu}} c_{m_f}^{\frac{\nu-1}{\nu}})^{\frac{\nu}{\nu-1}\frac{\theta-1}{\theta}}]^{\frac{\theta}{\theta-1}} \tag{3.18}$$

subject to the budget constraint

$$P_h c_{m_h} + P_f c_{m_f} + P_s c_s = w_h L_h + \pi_h \tag{3.19}$$

where ν denotes the elasticity of substitution between home and foreign manufacturing products, while θ denotes the elasticity of substitution between tradable and non-tradable goods. The first order conditions for utility maximization by home consumers determine the consumption of home and foreign manufacturing relative to services.

$$\frac{C_{mh}}{C_s} = \gamma' \frac{\gamma}{1-\gamma} (\frac{P_s}{P_h})^{\theta} (\gamma' + (1-\gamma')(\frac{P_h}{P_f})^{\nu-1})^{\frac{\theta-\nu}{\nu-1}}$$
$$\frac{C_{mf}}{C_s} = (1-\gamma') \frac{\gamma}{1-\gamma} (\frac{P_s}{P_f})^{\theta} (\gamma' (\frac{P_f}{P_h})^{\nu-1} + (1-\gamma'))^{\frac{\theta-\nu}{\nu-1}}$$

The first line of F.O.Cs gives the domestic demand for home manufacturing relative to services. Combining the second line of our F.O.Cs with the balanced trade condition,

we obtain the foreign demand for home manufacturing relative to services

$$C^*_{mf} = (1-\gamma')\frac{\gamma}{1-\gamma}(\frac{p_f}{p_h})^{1-\nu}(\frac{P_s}{P_h})^{\theta}(\gamma' + (1-\gamma')(\frac{P_h}{P_f})^{\nu-1})^{\frac{\theta-\nu}{\nu-1}}C_s \tag{3.20}$$

From the above conditions, we can derive the demand for home manufacturing (the sum of domestic and foreign demand) relative to services. Moreover, imposing the equilibrium conditions in the domestic markets for services and manufacturing (with balanced trade), relative consumption equals relative output:

$$\frac{y_m}{y_s} = \frac{C_m}{C_s} = \frac{C_{mh} + C^*_{mf}}{C_s}\overbrace{\frac{\gamma}{1-\gamma}(\frac{P_s}{P_h})^{\theta}}^{Baumol\,effect}\overbrace{[(\gamma' + (1-\gamma')(\frac{P_f}{P_h})^{1-\nu})^{\frac{1}{1-\nu}}]^{1-\theta}}^{Trade\,Effect} \tag{3.21}$$

Denoting with Φ_y the share of manufacturing in total output, and assuming, for simplicity, that ν is close to 1, (4) can be rewritten as:

$$\Phi_y = \frac{\phi_y}{1-\phi_y} = \frac{y_m}{y_s} = \frac{\gamma}{1-\gamma}(\frac{P_M}{P_S})^{-\theta}(\frac{P_F}{P_M})^{(1-\theta)(1-\gamma\prime)} \tag{3.22}$$

The sectoral shares crucially depend on two channels, the Baumol effect and the trade effect, which in turn operate through the relative price of home manufacturing vs services and through the relative price of home manufacturing vs foreign manufacturing. Interestingly, the quantitative effect of the trade channel crucially depends on the share of foreign manufacturing in the total manufacturing consumption of domestic consumers, which is given by $1-\gamma\prime$. As noted above, before the 1990s, the share of manufacturing imports from emerging economies in the GDP of advanced economies was almost insignificant. This share surged in the 2000s, especially because of the surge in Chinese exports.

In the next section we add the supply side to the model, which allows us to rewrite the relative price channels in terms of relative productivity growth and relatie wages. In order to derive the relative dynamics of employment and value added in the two sectors and distinguish the domestic sources from the foreign trade sources of structural change, we build an extremely simple model for the supply side.

3.3.1 The production side

We assume that services and manufacturing (both home and foreign) are produced by continuum of identical firms, whose mass is normalized to one. Production of the representative firm i is a function of labor (l), which is the only variable factor

$$y_i = F(A_i, l_i) = A_i l_i^{\alpha} \tag{3.23}$$

with $\alpha \leq 1$.

Let us begin with a closed economy framework. Labor can freely move across sectors, which implies that wages are equalized across sectors. Assuming a competitive labor market, workers are paid their marginal product in each sector:

$$\alpha A_i l_i^{\alpha-1} P_i = W_i \tag{3.24}$$

for $i = (m, s)$. The above conditions imply:

$$\frac{P_s}{P_m} = (\frac{l_m}{s})^{\alpha-1} \frac{A_m}{A_s} \tag{3.25}$$

Using the relative demand of the two goods, as a function of relative prices, setting the equilibrium condition $c_i = y_i$ and using the production function, we obtain the following condition for the ratio of employment in manufacturing in terms of services:

$$\frac{l_m}{l_s} = (\frac{A_m}{A_s})^{-\frac{1-\theta}{\alpha(1-\theta)+\theta}} \tag{3.26}$$

.

Log-differenting the above equation, with $\hat{x}$ denoting the percentage change of x, we can derive the dynamics of the relative employment in the two sectors:

$$\hat{l}_m - \hat{l}_s = -\frac{1-\theta}{\alpha(1-\theta)+\theta}(\hat{A}_m - \hat{A}_s) \tag{3.27}$$

Similarly, for the share in value added, we obtain:

$$\frac{y_m}{y_s} = (\frac{A_m}{A_s})^{\frac{\theta}{\alpha(1-\theta)+\theta}} \tag{3.28}$$

which implies that the change in the relative value added in the two sectors is

$$\hat{y}_m - \hat{y}_s = \frac{\theta}{\alpha(1-\theta)+\theta}(\hat{A}_m - \hat{A}_s) \tag{3.29}$$

Equations 3.27 and 3.29 indicate that in a closed economy framework there are two key parameters that determine the magnitude of the productivity-gap-driven structural change.[14] First, the output elasticity of labor, α : with high elasticity, there will be a stronger cross-sectoral reallocation for both value added and labor.

The second parameter is given by the substitutability in demand between manufacturing and services θ : when the elasticity of substitution is low, demand survives even in sectors with rising relative prices (i.e. services with low productivity growth). This induces a larger reallocation of labor towards low productivity sectors. Under our maintained assumption of θ close to zero, equation 3.29 implies that the manufacturing share in value added remains constant, in spite of the differential productivity growth in the two sectors. In summary, differential productivity growth across sectors causes structural change with respet to employment shares but not with respect to value added.

Let us now consider the open economy case. We assume competitive goods and labor markets, and perfect labor mobility across sectors within the country, but no mobility of labor across countries. To simplify the algebra and derive the simple expres-

[14]For a similar discussion of these two parameters see Imbs (2014),Ngai and Pissarides (2007) and Acemoglu and Guerrieri (2008)

sions for the dynamics of the value added and employment shares in the main text, we assume a linear production function:

$$y_i = A_i l_i \tag{3.30}$$

In an open economy, the following condition on relative prices holds:

$$(\frac{p_m}{p_s})^{\theta} = \frac{c_s}{c_m}\frac{\gamma}{(1-\gamma)}(\gamma' + (1-\gamma')\frac{p_h}{p_f}^{1-\nu})^{\frac{1-\theta}{1-\nu}} \tag{3.31}$$

Log-differentiating the above expression, and imposing the equlibrium conditions $c_i = y_i$, for $i = (m, s)$, yields:

$$\hat{y}_m - \hat{y}_s = -\theta(\hat{p}_m - \hat{p}_s) + (1-\theta)(1-\gamma')(\hat{p}_h - \hat{p}_f) \tag{3.32}$$

Under perfect competition, prices equal marginal costs:

$$p_i = \frac{w_i}{A_i} \tag{3.33}$$

Assuming perfect mobility across sectors, the dynamics of sectoral relative prices between manufacturing and services only depends on the dynamics of relative productivity

$$\hat{p}_s - \hat{p}_m = \hat{A}_m - \hat{A}_s \tag{3.34}$$

By contrast, lack of labor mobility across countries implies that the relative price of domestic manufacturing versus foreign manufacturing follows the dynamics:

$$\hat{p}_m - \hat{p}_{m^*} = (\hat{A}_m - \hat{A}_{m^*}) - (\hat{w}_{m^*} - \hat{w}_{m^*}) \tag{3.35}$$

Substituting the above two expressions in equation 3.32, we obtain the dynamics for value added. The dynamics of value added shares is a function of the relative growth of productivity in home manufacturing vs services (Baumol effect) and of the relative growth of productivity of home manufacturing vs foreign manufacturing (trade effect).

As we are focusing on trade of advanced with emerging economies (North-South trade), the maintained assumption is that the productivity growth in manufacturing is higher in emerging countries, which are catching up to the levels of productivity of advanced economies. The dynamics of the share of manufacturing in total value added is thus:

$$\hat{\Phi}_y = \overbrace{\theta(\hat{A}_m - \hat{A}_s)}^{Baumol\ effect} - \overbrace{(1-\theta)(1-\gamma\prime)[(\hat{A}_F - \hat{A}_m) - (\hat{w}_F - \hat{w}_m)]}^{Trade\ Effect} \tag{3.36}$$

The closed economy channel (Baumol effect) implies that a faster growth in productivity in manufacturing relative to services would increase the manufacturing share. However, given the low substitutability in consumption of manufacturing and services, θ is likely to be close to zero and thus, absent the trade effect, the share of manufacturing in total value added remains constant, at the value $\frac{\gamma}{1-\gamma}$. Therefore, with low substitutability in consumption between manufacturing and services, deindustrialization as measured in terms of value added shares occurs entirely through the trade channel.

To move from the dynamics of the value added shares to the employment shares , we simply use the following relationship from the production function:

$$\hat{l}_i = \hat{y}_i - \hat{A}_i \tag{3.37}$$

Analyzing employment shares,the dynamics of the employment share of manufacturing in total employment is given by the following equation:

$$\hat{\Phi}_l = -\overbrace{(1-\theta)(\hat{A}_m - \hat{A}_s)}^{Baumol\,effect} - \overbrace{(1-\theta)(1-\gamma\prime)[(\hat{A}_F - \hat{A}_m) - (\hat{w}_F - \hat{w}_m)]}^{Trade\,Effect} \tag{3.38}$$

Again, assuming low substitutability between services and manufacturing products, θ is close to zero. Therefore, faster productivity growth in manufacturing relative to services, will induce, through the Baumol effect, a proportional fall in the share of manufacturing in total employment. The trade effect depends not only on the dynamics of productivity differentials between manufacturing at home and abroad, but also on the dynamics of real wages in manufacturing at home and abroad.

In summary, the trade channel helps to rationalize the deindustrialization in advanced economies, measured both in terms of employment ad value added shares. By contrast, the closed economy channel (Baumol effect) predicts deindustrialization in terms of employment shares but not in terms of value added shares. Therefore, in spite of its simplicity, the model provides a sharp implication that can be empirically verified: different behavior of employment and value added shares will provide the basis for our assessment of the relevance of the trade channel, versus the traditional productivity channel.

As noted above, following China's entry in the WTO two main stylized facts stand out. First, as already emphasized in the literature,there is a marked increase in the exposure of manufacturing production in advanced economies to imports from China.

Second, and less noted, Chinese exports become increasingly concentrated in ICT sectors. This second stylized fact likely reflects a changing nature of productivity growth in China. We thus extend the model to account for the changing nature of Chinese trade and the accompanying change in the determinants of productivity growth.

3.4 The changing nature of Chinese trade and technological change

In the last twenty years China experienced a rapid process of technological change and adoption of innovation, shifting from a process of efficiency improvements in traditional industries to faster change in technological change, which was associated to a changing patter of trade specialization. One feature of technological change is that new technologies rapidly displace old ones, determining a faster depreciation of the existing capital stock.

This channel potentially modifies the process affecting structural change in advanced economies that trade with an emerging economy like China. Specifically, if faster productivity growth in China derives from a faster process of technological change, the trade effect, inducing in the advanced trading partner a decline in the share of manufacturing in both employment and value added, becomes stronger.

Figure 3 displays the difference in levels between the depreciation rate in China with respect to the average OECD countries. After the year 2000, there is a sharp increase in China unmatched by the behavior of depreciation in OECD countries. The jump in the rate of depreciation seems to confirm our conjecture on a shift in the pattern of technological change in the Chinese economy.

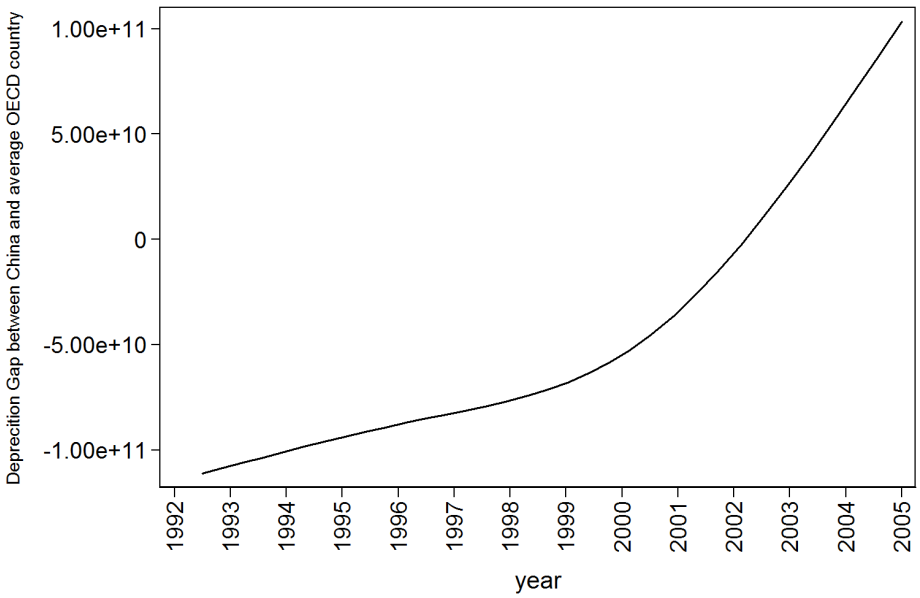


Figure 3.25: Depreciation gap in level $\delta_{CHINA} - \delta_{Average\,OECD}$

This new channel can be derived from a simple extension of our previous model.

3.4.1 Technological change and depreciation of capital

We assume that manufacturing (both home and foreign) is given by bundles of different varieties of goods, which are produced by a continuum of identical monopolistically competitive firms, whose mass is normalized to one. Each firm in sector i is the unique producer of a differentiated product variety, which is imperfectly substitutable to the other varieties within the sector i, with σ denoting the elasticity of substitution.

$$Y_i = (\int_{\Omega_i} y_i^{\frac{\sigma-1}{\sigma}}(\omega)d\omega)^{\frac{\sigma}{\sigma-1}} \tag{3.39}$$

with $\epsilon\{h, f\}$

We introduce the role of technological change and the depreciation of capital associated to old technologies in the simplest way, by assuming that every firm has to use one unit of fixed capital to have a positive production. This i unit of capital depreciate at the rate δ_i . Firm's demand for labor to produce q_i units of the individual variety in sector i, as well as replacing δ_i units of depreciated capital, is given by

$$l_i = \delta_i + \frac{y_i}{A_i} \tag{3.40}$$

whereA_i indicates productivity in sector i. The zero profit condition implies that

$$y_i = A_i \delta_i (\sigma - 1) \tag{3.41}$$

Combining the last two equations we find

$$y_i = A_i \frac{\sigma - 1}{\sigma} l_i \tag{3.42}$$

We next derive optimal prices from the optimization problem for a monopolistically competitive firm:

$$max_{p_{ij}} \pi_{ij} = p_{ij} x_{ij} - C(x_{ij}), \tag{3.43}$$

Thus, the price that set by firms is given by

$$p = \frac{\sigma}{\sigma - 1} \frac{w}{A} \tag{3.44}$$

which implies that the firm sets prices as a constant markup over its marginal costs, which is equal to $\mu = \frac{\sigma}{\sigma - 1}$.

Finally, denoting γ' for the foreign country with a star (γ'^*), assuming that ν is close to 1 and that trade is balanced, we can derive the relative demand for home and

foreign manufacturing goods, which in equilibrium will be equal to the relative supply.

$$\frac{y_m}{y_f} = (\frac{p_f}{p_h})\frac{1-\gamma'^*}{1-\gamma'} \tag{3.45}$$

Using 3.45, 3.44 and 3.41, we can substitute for prices and value added to obtain the relative wage dynamics. Log-differentiating, we obtain:

$$(\hat{w}_m - \hat{w}_f) = \frac{(\nu-1)}{\nu}(\hat{A}_m - \hat{A}_f) - \frac{1}{\nu}(\hat{\delta}_m - \hat{\delta}_f)] \tag{3.46}$$

This gives us the dynamics in the relative wage gap as a function of the relative dynamics in productivity and depreciation rates:

$$(\hat{A}_m - \hat{A}_f) - (\hat{w}_m - \hat{w}_f) = \frac{1}{\nu}[(\hat{A}_m - \hat{A}_f) + (\hat{\delta}_m - \hat{\delta}_f)] \tag{3.47}$$

Assuming ν is close to 1, the relative dynamics of the wage gap between wages of domestic versus foreign manufacturing is just a function of relative changes in depreciation rates:

$$(\hat{w}_m - \hat{w}_f) = -(\hat{\delta}_m - \hat{\delta}_f)] \tag{3.48}$$

Therefore, the dynamics of manufacturing shares in employment and value added in open economies become:

$$\hat{\Phi}_l = -\overbrace{(1-\theta)(\hat{A}_m - \hat{A}_s)}^{Baumol\ effect} - \overbrace{(1-\theta)(1-\gamma\prime)[(\hat{A}_f - \hat{A}_m) + (\hat{\delta}_f - \hat{\delta}_m)]}^{Trade\ Effect} \tag{3.49}$$

for employment shares and

$$\hat{\Phi}_y = \overbrace{\theta(\hat{A}_m - \hat{A}_s)}^{Baumol\ effect} - \overbrace{(1-\theta)(1-\gamma\prime)[(\hat{A}_f - \hat{A}_m) + (\hat{\delta}_f - \hat{\delta}_m)]}^{Trade\ Effect} \tag{3.50}$$

for value added shares.

The difference between the change in depreciation rates in foreign versus domestic manufacturing is a proxy of the relevance of innovation in manufacturing and possibly on its impact on trade specialization. This effect seems to capture the increasing competition exerted by China in ICT sectors.

3.5 Data and Empirical Strategy

In this section, we describe the dataset and our empirical strategy, especially in connection with the identification of the trade effect.

3.5.1 Data

Our dataset for employment and real value added at country-industry pairs is collected from the June 2013 release of the OECD Structural Analysis (STAN) database. Employment is measured by the total number of people at work, and value added is expressed in real 2005 prices using sector-specific deflators, in local currency. Data are available from 1992 to 2007, for a sample of 14 OECD countries including the United States, the United Kingdom, Sweden, Norway, the Netherlands,Italy, Hungary, France, Finland, Denmark, Germany, the Czech Republic, Belgium and Austria. The data are rearranged at the two-digit level, with up to 99 categories for all sectors in the economy according to the 3rd revision of International Standard Industrial Classification (ISIC).

Data for trade exposure are obtained from the UN Comtrade Database on imports from China at the six-digit Harmonized System (HS) product level, for the period 1992-2007.

To make the industry classification for trade data comparable with industry data on structural change from STAN, we adopt the crosswalk methodology by using the concordance of 1992-2007 HS codes to ISIC from The World Integrated Trade Solution (WITS). This allows us to translate our import data from the six-digit HS classification into the ISIC 4-digits, which then we aggregate to the 2-digits.

3.5.2 Index of Exposure to Chinese Imports

Several studies have focused on a measure of exposure to Chinese imports as a main channel affecting labor market variables in the US (Autor et al. (2013), Acemoglu et al. (2016), Pierce and Schott (2012)). Moreover, Bloom et al. (2016) investigate the impact of the trade exposure through growth of Chinese import on technical change in OECD countries. The application of such index of exposure to Chinese imports has been extended to other issues, as for instance the effect of trade exposure on the support for the leave campaign across the UK regions in the Brexit referendum (Colantone and Stanig (2016)).

Following this literature, we construct our trade exposure index (TEX) to low income countries for each of our country-industry pairs. TEX measures the extent to which each country-industry pair is affected by the surge in import competition from China after 2000.

We calculate η_{ij} the Napierian logarithm of the ratio of the average Chinese import during the 2000s relative to the 1990s, which, for each industry of our 14 countries, is defined as follows

$$\eta_{ij} = log(\bar{\sigma}_{ij}^{2000s}) - log(\bar{\sigma}_{ij}^{1990s}) \tag{3.51}$$

where σ_{ij_t} indicates imports from China in period t, in industry j, in country i. Thus, ($\bar{\sigma}_{ij}^{1990s}$) and ($\bar{\sigma}_{ij}^{2000s}$) indicate the average imports during 1990s and 2000s from China for all industry-country pairs.

During the years 2000s, import competition from China surges in most OECD countries. However, the magnitude of such increase in the exposure to Chinese imports varies significantly across industry-country pairs: η_{ij} captures this variation. Interestingly, we could not identify any clear clustering of countries or industries in connection with exposure to Chinese imports. Therefore, the variation of such indicator across country-industry pairs makes this indicator well suited in the regression analysis for structural change.

Finally, we construct the dummy for high exposure to Chinese import as follows

$$\delta_{ij}^{ImEx} = \begin{cases} 1 & if \quad \eta_{ij} >= \eta_{Mdn} \\ 0 & if \quad \eta_{ij} < \eta_{Mdn} \end{cases} \tag{3.52}$$

where η_{Mdn} indicates the median of the distribution of η on the pooled data of country-industry pairs.

If for industry j in country i $\eta_i j$ is higher than η_{Mdn}, the dummy variable for the Chinese import exposure takes the value of one and it takes the value of zero otherwise.

3.5.3 Identification

The objective of our regression analysis is to estimate the average yearly growth rates in the sectoral shares in total employment, or total value added. We follow the accounting proposed by Imbs (2014) to measure structural change.

$\hat{S}_{ijt}$ is the growth rate in the share S_{ijt} (in total value added or in aggregate employment) of sector j in country i at time t, and it is given by

$$\hat{S}_{ijt} = \frac{dln(S_{ijt})}{dt} = \frac{S_{ijt+1} - S_{ijt}}{S_{ijt}} \tag{3.53}$$

The share of employment in sector j country i at time t is equal to the total number of employee in sector j, in country i at time t (excluding self employed) divided by the total number of employee (excluding self employed) in country i at time t:

$$S_{ijt}^{EM} = \frac{N_{ijt}}{\sum_{j} N_{ijt}} \tag{3.54}$$

As a robustness check, we will also consider the shares in relation with the total number of hours worked rather than the total number of employees.

The share of value added is equal to the value added of sector j at country i time t divided by the total value added of the country at time t:

$$S_{ijt}^{VA} = \frac{Y_{ijt}}{\sum_{j} Y_{ijt}} \tag{3.55}$$

Our main estimation is given by

$$\hat{S}_{ijt} = \alpha_{ij} + (\beta_1 + \beta_2 \delta_{ij}^{ImEx}) \delta_t^{2000} + \epsilon_{ijt} \tag{3.56}$$

where i defines countries, j indexes the two-digit sectors and t denotes time.

On the right-hand side of the regression, α_{ij} is a fixed effect that is specific to each industry in each country and captures the average growth rate before the year 2000.

Furthermore, to study the potential differences in structural change in two broad groups of sectors, the ICT versus the non-ICT sectors, we divide our sample into E/O (Electrical and Optical industries) and Non-E/O industries using a dummy variable $\delta_{ij}^{E/O}$, which takes the value of one for E/O sectors and zero otherwise. Accordingly, our second estimation is given by

$$\hat{S}_{ijt} = \alpha_{ij} + [\beta_1 + \beta_2 \delta_{ij}^{ImEx} + (\beta_3 + \beta_4 \delta_{ij}^{ImEx}) \delta_{ij}^{E/O}] \delta_t^{2000} + \epsilon_{ijt} \tag{3.57}$$

In summary, our empirical strategy has several elements that help to identify the trade effect on structural change.

First, we split the data in two periods, namely the pre and post-WTO accession of China, assuming that entry of China into the WTO is exogenous to structural change in OECD countries.

Second, as in previous studies, we take the change in the exposure to Chinese imports as the variable measuring the trade effect. However, we add two additional steps to the analysis in order to better disentangle the trade from the productivity channel. One is the distinction between ICT and non-ICT sectors, which allows us to control for the fact that ICT sectors in OECD countries were characterized before the 2000s by a simultaneous fast increase in productivity and an increase in their employment shares.

Furthermore, a large component of the surge in Chinese post-WTO entry imports was associated to ICT sectors. Finally, we analyze both employment and value added shares, and by comparing the results of the two different estimates we can draw inference on the relevance of the trade effect.

3.6 Results

Table 3.24 reports the estimates of the coefficients in equation 3.56, estimated on pooled data for all manufacturing country-industry pairs. While country-industry fixed effects capture the average growth rate in shares of the sectors during 1990s, β_1, captures the difference in the average yearly growth rate after and before 2000s for low exposure country. β_2, captures the difference-in-difference between the average yearly growth rate in the shares after and before 2000 for high and low import exposure country-industry pairs.

Column (2) of Table 3.24 illustrates the general acceleration of deindustrialization among all sectors after 2000s in OECD countries . However, during the 2000s, the high-import-exposure group of country-industry pairs experienced a much faster decline in employment shares than the low-import-exposure group. Indeed, the share of employment contracted on average by 0.4 % per year more during the 2000s compared with the 1990s among the low-exposure group, while the employment share for the high-exposure group fell by 1.3 % a year more in the 2000s than in the 1990s.

This result is consistent with our hypothesis that manufacturing sectors with more exposure to imports from fast growing Chinese manufacturing experienced a stronger fall in employment.

Table 3.24: Structural Change and Trade Effect

	(1) Growth in the share of Value Added (%) b/se	(2) Growth in the share of Employment (%) b/se	(3) Growth in the share of Hours Worked (%) b/se
Difference in growth rate of the share of sectors among Low exposure sectors After and before 2000 $\Delta_L = \hat{S}_{2000s} - \hat{S}_{1990s}$			
$\beta_1 : \delta_t^{2000}$=1	-0.000	-0.004***	-0.006**
	(0.00)	(0.00)	(0.00)
Difference-in-Difference for High vs Low exposure After and before 2000 $\Delta\Delta = \Delta_H - \Delta_L = (\hat{S}^H_{2000s} - \hat{S}^H_{1990s}) - (\hat{S}^L_{2000s} - \hat{S}^L_{1990s})$			
$\beta_2 : \delta_{ij}^{ImEx\geq 50\%}$=1 $\times$ δ_t^{2000}=1	-0.012**	-0.009***	-0.012***
	(0.01)	(0.00)	(0.00)
Industry Country fixed effect	Yes	Yes	Yes
Observations	3353	3366	1748

A comparison of the estimates for the employment shares (column 2) and the value added shares (column 1) provides further confirmation of our prior on the relevance of the trade effect. Indeed, if we consider only the low-exposure sectors, we find no differential behavior in the 2000s relative to the 1990s, as β_1 is not significantly different from zero. Therefore, low-exposure sectors seem to behave in line with the Baumol effect, as they experienced a fall in their share over total employment, although they maintained unchanged their share in total value added.

Column (3) indicates that the employent adjustment is even stronger if one considers hours worked rather than the number of employees. [15]

Table 3.25 reports the coefficient of the estimation of equation 3.57, which allows for a different effect across E/O (Electrical and Optical industries) and Non E/O in-

[15] It is worth noting that due to more aggregated data for reporting the hours worked the sample size is considerably reduced.

dustries. $\delta_{ij}^{E/O}$ and $\delta_{ij}^{ImEx_{EO}}$ are two dummies that divide our sample into four groups.

The first group is given by Non E/O sectors with low exposure to Chinese imports. β_1 indicates that the employment share and the share in hours worked respectively contracted per year by .7% and 1.2% faster during 2000s compared with 1990s, while there is no significant change in the share of value added. The second group includes E/O industries with low exposure and the third group includes Non E/O industries with high exposure. The value of the coefficients β_2 and β_3 point out that the behavior of theses two groups do not display any statistically significant difference with respect to the first group.

By contrast, β_4 indicates that for high exposure E/O industries, the increase in the pace of contraction per year in their share of value added , employment and hours worked during the 2000s, compared with their rate in the 1990s, is significantly higher than for the other three groups. Specifically, value added , employment and hours worked declined per year by 6.5 % , 3.3% and 5.3% more after 2000 compared with the 1990s.

Again, these results confirm the pattern of deindustrialization associated to the trade effect for ICT sectors with high exposure to Chines imports. In summary, the sharp acceleration of deindustrialization of ICT manufacturing through the trade effect played a key role in explaining the process of structural change in OECD countries during the years 2000s.

Table 3.25: Decomposition of Structural Change And Trade Effect

	(1) Growth in share of Value Added (%)	(2) Growth in share of Employment (%)	(3) Growth in share of Worked Hours (%)
	b/se	b/se	b/se
Difference in average yearly growth rate Low exposure Non E/O sectors After and before 2000			
$\Delta_L = \hat{S}_{2000s} - \hat{S}_{1990s}$			
$\beta_1 : \delta_t^{2000}$=1	-0.001	-0.007***	-0.012***
	(0.00)	(0.00)	(0.00)
Difference in Difference between Non E/O and E/O among low exposure $\Delta\Delta_L = \Delta_L^{E/O} - \Delta_L^{NonE/O}$			
$\beta_2 : \delta_{ij}^{E/O}$=1 $\times \delta_t^{2000}$=1	-0.016	-0.002	0.005
	(0.01)	(0.01)	(0.01)
Difference in Difference for high and low exposure among Non E/O $\Delta\Delta^{NonE/O} = \Delta_H^{NonE/O} - \Delta_L^{NonE/O}$			
$\beta_3 : \delta_{ij}^{ImEx_{EO}\geq 50\%}$=1 $\times$ δ_t^{2000}=1	-0.010	-0.004	0.003
	(0.01)	(0.00)	(0.01)
Difference in Diff in Diff for E/O and Non E/O industries $\Delta\Delta\Delta = \Delta\Delta_H^{E/O} - \Delta\Delta^{NonE/O} - \Delta\Delta_L$			
$\beta_4 : \delta_{ij}^{E/O}$=1 $\times$ $\delta_{ij}^{ImEx_{EO}\geq 50\%}$=1 $\times$ δ_t^{2000}=1	-0.038*	-0.020**	-0.049***
	(0.02)	(0.01)	(0.01)
Industry Country fixed effect	Yes	Yes	Yes
Observations	3353	3366	1748

3.7 Concluding Remarks

In line with previous results obtained in the literature (Autor et al. (2013), Acemoglu et al. (2016) and Pierce and Schott (2012)) we found a significant effect of exposure to imports from China on sectoral employment. Our results extend to OECD countries the results previously obtained for the US.

Our main contribution has been to emphasize the relationship between external trade and structural change, specifically the decline of the share of employment and value added in the manufacturing sectors. The exposure to imports from China was the main identifying instrument, as such exposure surged in correspondence to the entry of China into the WTO. Entry into the WTO is thus the exogenous treatment that allows us to estimate the post WTO-entry relative to pre-WTO entry.

Using a simple model of structural change with two sectors (manufacturing and services), we stressed the fact that in a closed economy structural change derives from faster productivity growth in manufacturing. This effect, the so-called Baumol effect, in general cannot be easily separated from the external trade effect. However, a clear implication of the Baumol effect is that the employment share of manufacturing declines whereas the share of manufacturing in total value added remains constant. The potential difference in the behavior of employment and value added shares gives us a channel to identify the trade versus the productivity effects. Indeed, in our estimations we find that the decline in employment shares is significant in all sectors, irrespective of their exposure to import competition. As long as the exposure to Chinese imports is small, the share of value added does not accompany the fall in the share in employment. It is only when the exposure to Chinese imports becomes quantitatively large that the share in value added falls.

This confirms that the trade channel became relevant in the 2000s, following the surge in Chinese exports to OECD countries. Furthermore, we uncovered another effect on structural change associated to trade with emerging economies, an effect that derives from the changing sources of productivity change in manufacturing in emerging economies. Indeed, if productivity growth is associated to a process of rapid

technological change, which induces scrapping of old productions, the trade effect becomes stronger. We find empirical evidence of this channel: after 2000, in advanced economies, ICT sectors more exposed to Chinese imports display a stronger decline in both employment and value added relative to non-ICT sectors. Our conjecture is that in these sectors the depreciation of capital is faster in emerging economies. As a consequence, wages in emerging economies do not catch up with productivity changes, as part of output produced has to cover the depreciation of capital.

We plan to extend the work in the paper in several directions. First, it would be interesting to extend the model to a framework in which productivity and trade interact. Indeed, in general we cannot take exposure to trade and productivity change as independent processes. For instance, as shown by Bloom et al. (2016) and Autor et al. (2016), exposure to trade with China has an effect on innovation by US firms. The model can thus be extended to a framework with heterogeneous firms, in the spirit of a Melitz-Chaney[16]. In the model with heterogeneous firms, the participation by firms in international trade depends on their productivity.

Second, along the lines explored in (Coricelli et al., 2013) to analyze the relationship between the German huge and persistent current account surplus and structural change, we plan to extend both the theoretical and the empirical analysis to a framework with unbalanced trade. This extension is relevant as OECD countries are characterized by significantly different positions in terms of trade balances.

In summary, our analysis indicates that extending models of structural change to an open economy context is crucial to understanding the process of sectoral reallocation of resources in advanced economies in the last decades.

[16]First proposed byMelitz (2003) and then extended by Chaney (2008).

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Summary

This thesis investigates the role of collateral environment and trade exposure on the allocation of employment across firms and sectors. The first chapter argues that, in these economies with poor institutional quality of collateral and bankruptcy laws, aggressive collateralization makes the risk-taking behavior of borrowers suboptimally more costly. This discourages entrepreneurship and thus impedes the growth potential among young firms with a potentially high impact on job creation in the economy. Second chapter stresses the "disconnection" channel on the performance of firms when stringent collateral environment impedes the access of firms to financial system. Studying the 6 economies in MENA we observe region is characterized by an unusually high share of firms that do not need external finance. These firms are less likely to view access to finance as a major concern, are less likely to have purchased fixed assets, and are less likely to plan further expansion. These findings also hold after accounting for a standard set of firm characteristics. In the third chapter, I move to a sample of OECD countries. A growing body of literature emphasizes the role of trade with emerging economies, especially with China, in job destruction in the manufacturing sectors and in the deindustrialization process currently seen in advanced economies. However, to quantify the relevance of exposure to imports from emerging markets, the trade channel needs to be disentangled from the traditional productivity channel. Developing a simple model of structural change in an open economy, I derive empirical implications to analyze for a sample of OECD countries. The model illustrates when productivity growth of domestic manufacturing is faster than that of services but slower than that of foreign manufacturing, the share of manufacturing in advanced economies may fall, both in terms of value added and of employment. I call this phenomenon "twin deindustrialization". My empirical results indicate significant and quantitatively relevant effects of trade on structural change in advanced economies. Furthermore, while many studies investigate the accelerating volume of imports from China post 2000 to explain

the pattern of deindustrialization in advance economies, I stress that the shift in the composition of Chinese exports towards the ICT sectors and the changing nature of technological progress occurring in emerging economies are important considerations in understanding the pattern of deindustrialization in the post 2000 period.

Keywords

Transactional cost , Discouragement

Disconnection

Twin deindustrialization, Import exposure

MENA, OECD

Résumé

Le premier chapitre soutient que dans ces économies om la qualité institutionnelle des lois sur les garanties et les faillites est faible, la collatéralisation excessive rend la prise de risque sous-optimalement plus couteuse pour les emprunteurs. Cela décourage le potentiel entrepreneurial et entrave ainsi la croissance potentielle de jeunes entreprises ayant un impact important sur la création d'emplois dans l'économie.
Le deuxième chapitre met l'accent sur le canal de « déconnexion». La région du MENA est caractérisée par une proportion inhabituellement élevée d'entreprises qui n'ont pas besoin de financement. Ces entreprises sont moins susceptible de considérer l'accès au crédit comme une préoccupation majeure, sont moins susceptibles d'avoir acquis des immobilisations, et sont moins susceptibles de prévoir une opération de développement. Ces résultats tiennent également en tenant compte de l'ensemble des caractéristiques standard des entreprises. Nous étudions ensuite comment la politique de collatéralisation impact les performances des entreprises à traves le canal de « déconnexion ».
Dans le troisième chapitre, je passe à un échantillon de pays de l'OCDE. Une littérature croissante souligne le rôle du commerce avec les économies émergentes, en particulier la Chine, dans la destruction des emplois dans le secteur manufacturier comme le processus de désindustrialisation des les économies avancées. Cependant, pour quantifier la pertinence de l'exposition aux importations en provenances des marchés émergents, nous devons démêler le canal commercial du canal de productivité traditionnel. Dans ce chapitre, nous développons un modèle simple du changement structurel dans une économie ouverte pour en déduire des implications empiriques que nous analysons pour un échantillon de pays de l'OCDE. Dans les économies ouvertes, lorsque la croissance de la productivité de l'industrie nationale est plus rapide que celle des services, mais plus lente que celle de l'industrie étrangère, alors la part industrielle peut diminuer dans les économies avancées, tant en valeur ajoutée qu'en emploi. Nous appelons ce phénomène « double désindustrialisation ». Nous trouvons des effets significatifs et quantitativement pertinents du commerce sur le changement structurel dans les économies avancées. En outre, alors que de nombreuses études étudient l'accélération de l'ampleur des importations en provenance de Chine depuis 2000 pour expliquer le

modèle de désindustrialisation dans les économies avancées, nous soulignons que le changement de la composition des exportations chinoises vers les secteurs des technologies d'information et de communication et la naturante changeante du progrès technologique dans les économies émergentes pourrait contribuer à la compréhension du phénomène de désindustrialisation de l'après 2000.

Mots-clés

Coûts de transaction, Découragement

Déconnexion

Double désindustrialisation, Exposition aux importations MENA, OECD