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Par
Arnaud HERAULT

Intégration et ségrégation des immigrés sur le marché du travail

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Rapporteurs avant soutenance :

Isabelle Chort	Professeure des universités, Université de Pau et des pays de l'Adour
Pascale Petit	Maître de conférences HDR, Université Gustave Eiffel

Composition du Jury :

Examinateurs :	Xavier Chojnicki	Professeur des universités, Université de Lille
	Isabelle Chort	Professeure des universités, Université de Pau et des pays de l'Adour
	Fabien Moizeau	Professeur des universités, Université de Rennes 1
	Pascale Petit	Maître de conférences HDR, Université Gustave Eiffel
Dir. de thèse :	Eva Moreno-Galbis	Professeure des universités, Université d'Aix-Marseille
Co-dir. de thèse :	François-Charles Wolff	Professeur des universités, Université de Nantes
Invité :	Ahmed Tritah	Maître de conférences HDR, Université du Mans

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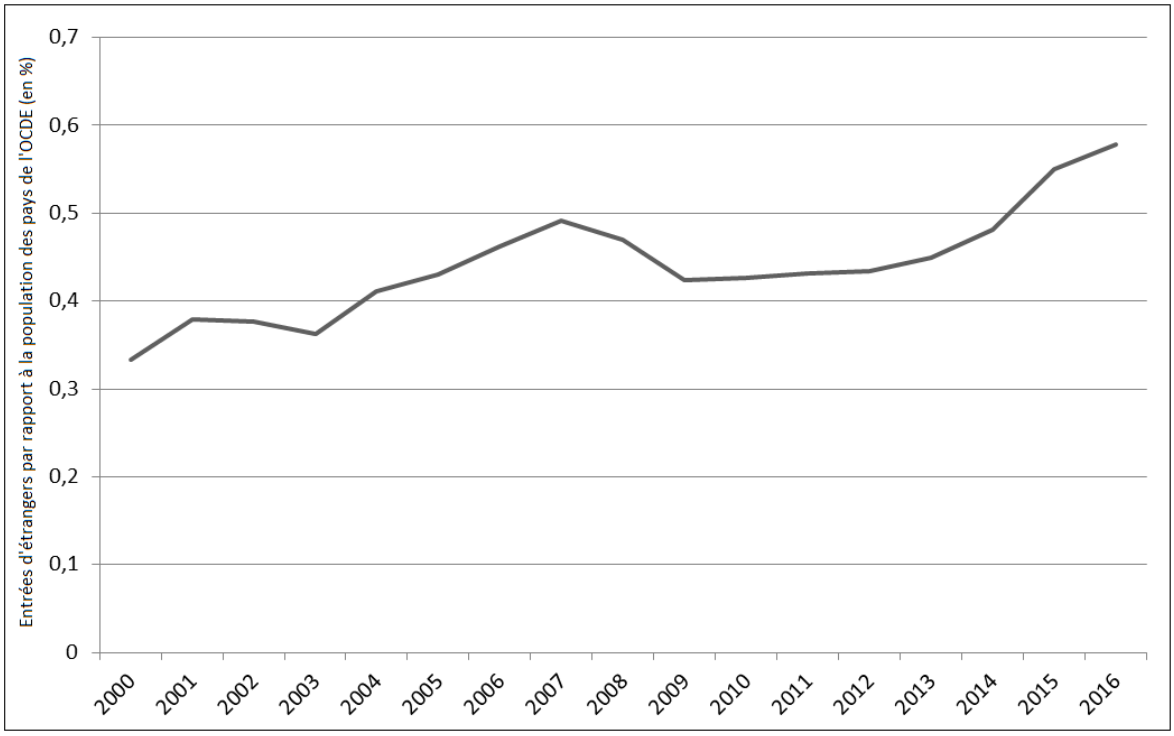
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Introduction Générale

Les flux de population internationaux ne cessent de croître depuis plusieurs décennies. Dans les pays de l'OCDE, cette évolution se caractérise notamment par une évolution croissante du nombre d'entrées de personnes nées à l'étranger (Figure 1). Le pourcentage d'entrées d'immigrés dans les pays de l'OCDE, par rapport à la population totale, a plus que doublé depuis les années 2000. Même si ce pourcentage reste relativement faible comparé à la population des pays hôtes, cette rapide évolution du nombre d'entrées s'est caractérisée par de nombreux débats politiques et médiatiques notamment à travers les sujets tels que les traversées tragiques en Méditerranée, les réfugiés climatiques ou bien la régularisation des sans-papiers.

Figure 1 – Evolution du pourcentage d'entrées de personnes étrangères dans les pays de l'OCDE



Source : OCDE
Le pourcentage d'entrées de personnes étrangères correspond au nombre de personnes étrangères entrantes dans les pays de l'OCDE divisé par la population totale dans les pays de l'OCDE

Le terme d'immigration regroupe souvent des thématiques très vagues caractérisant des problématiques sociétales comme le soulignent Beaud et Noiriel (Beaud and Noiriel, 1990, p 43) : "*Cette indétermination du vocabulaire est sans doute l'une des raisons qui explique que la "question de l'immigration" fonctionne aussi bien comme instrument de mobilisation et de polémiques politiques. A partir du moment où chacun met ce qu'il veut derrière les mots, tout le monde peut se sentir concerné par le "problème"*". Ces propos soulignent le traitement connoté des questions relatives à

l'immigration dans le débat public en profitant du manque de précision concernant la définition de l'immigration tout en caractérisant la pluridisciplinarité de ce sujet.

En se basant sur la définition même de l'immigration, c'est à dire l'action de déplacement d'un individu entre deux territoires caractérisée à la fois par une installation dans une région différente de la région d'origine ainsi qu'un aspect international lorsqu'il y a un franchissement de frontière(s), la thématique de l'immigration est caractérisée par une approche pluridisciplinaire intégrant notamment des notions juridiques, géographiques, démographiques et linguistiques et économiques.

Appliquée à la science économique, l'analyse de l'immigration, traditionnellement, se focalise sur les performances des immigrés sur le marché du travail (Borjas, 1988, Borjas and Bronars, 1991, Dustmann and Fabbri, 2003). La compréhension des performances des immigrés sur le marché du travail est intimement liée aux motivations migratoires initiales. En effet, dans le cas des migrations non contraintes, la temporalité de la migration ainsi que les raisons des migrations influencent le comportement des immigrés sur le marché du travail dans la société d'accueil. Dans le cadre d'une migration temporaire avec des motivations économiques, les immigrés maximiseront leurs revenus dans le pays d'accueil sans investir dans le capital humain du pays d'accueil, notamment en termes linguistiques. A l'inverse, si un immigré s'installe de manière permanente dans le pays d'accueil, l'individu aura des incitations à effectuer un effort pour adopter les normes et coutumes du pays d'accueil (Dustmann, 2000, Dos Santos and Postel-Vinay, 2005).

Il existe donc une hétérogénité des profils d'immigrés qui, pour le cas de la France est caractérisée un passé migratoire marqué par des vagues migratoires en provenance de deux régions principalement : l'Europe du Sud et l'Afrique du Nord (Brutel, 2014). Depuis la période de l'après-guerre, les Européens du Sud puis successivement les Maghrébins sont arrivés par vague en France. Par exemple, durant les années 1960, l'immigration maghrébine était caractérisée par deux typologies de migrants (Ageron, 1985) : une migration *solidaire* et une migration *solitaire*. La migration *solidaire* était composée principalement d'hommes, migrant seuls, mariés et ayant un projet de migration temporaire. La motivation de migration de ces individus était de bénéficier du différentiel de salaire positif de la France, en comparaison avec le salaire de leur pays d'origine, pour subvenir aux besoins de leur famille restée dans le pays d'origine. La migration s'inscrivait dans un projet limité dans le temps. Pour cette raison, le lien entre les migrants et leur pays d'origine restait fort du fait du retour dans le pays d'origine peu de temps après le départ initial (Ageron, 1985, Khellil, 2012).

Les migrants dits *solitaires* étaient eux caractérisés par une séparation avec le pays d'accueil. Le lien entre le pays d'origine et les migrants n'était pas maintenu. Cette séparation avec le pays d'origine des migrants était substituée par un renforcement du lien entre la société d'accueil et les migrants.

Ce constat concernant les immigrés originaire d'Afrique du Nord caractérise à la fois l'évolution des profils migratoires des immigrés pour une même origine, mais également l'hétérogénéité des comportements migratoires des individus.

La typologie différente de ces immigrés ayant une origine commune met en évidence l'hétérogénéité des comportements des individus lors de leur arrivée dans le pays de destination. L'analyse de ces typologies se positionne dans la compréhension du processus d'intégration des immigrés dans les pays d'accueil. L'intégration se définit comme étant le processus durant lequel un individu acquiert les us et coutumes du pays d'accueil (Penninx, 2005). Ce processus se détermine par la définition même de l'intégration selon l'Académie Française [1]. La définition de l'intégration se caractérise par l'*action d'intégrer, le fait de s'intégrer*. Lorsque l'on se focalise sur la définition du verbe intégrer, la définition caractérise le fait de *faire entrer un élément dans un ensemble de sorte qu'il en devienne une partie constitutive* [2]. Il est intéressant de constater que ces définitions caractérisent à la fois l'importance du processus temporel de l'intégration, mais également l'homogénéité relative à un groupe, en l'occurrence un groupe d'individus, lorsque ces derniers sont dits *intégrés* au sein d'une société.

La définition de l'intégration, insistant sur l'aspect homogène relatif à un groupe, peut être mise en parallèle avec le modèle d'intégration français. Le modèle d'intégration français se fonde sur différents principes relatifs à l'égalité entre les individus, l'absence de reconnaissance des minorités ainsi qu'une acceptation des spécificités culturelles partielle [3]. Le modèle d'intégration français place en son centre l'individu en tant qu'être et n'a pas vocation à cultiver les différences, les traditions culturelles des individus spécifiques à leur origine. La mise en place de ce modèle d'intégration se fonde notamment sur la notion de droit commun en offrant à chaque individu un socle commun (législatif, éducatif et social) permettant à tout un chacun de s'intégrer en tant qu'individu sans cultiver les spécificités culturelles.

1. Voir Dictionnaire de l'Académie Française. https://www. dictionnaire-academie.fr/article/A9I1593. Page consultée le 6 février 2020.

2. Voir Dictionnaire de l'Académie Française. https://www.dictionnaire-academie.fr/article/A9I1596. Page consultée le 6 février 2020.

3. Voir le rapport du Haut Conseil à l'Intégration, Anstett (2010)

Au-delà de ces aspects individuels et formels, l'installation permanente des immigrés dans le pays d'accueil est également caractérisée par la structuration de réseaux sociaux (Massey, 1990, Gill and Bialski, 2011). La structuration de ces réseaux dépend de la distribution spatiale des immigrés sur le territoire. En effet, les immigrés ont tendance à se concentrer spatialement au sein des grandes aires urbaines [4]. Même si ce fait n'est pas homogène selon les origines, certaines ont tendance à avoir des choix de localisation similaires aux natifs, l'incitation des nouveaux arrivants à se positionner dans les grandes aires urbaines dépend des choix de localisation des immigrés établis (Brutel, 2014).

La concentration spatiale des pairs dans un espace géographique restreint peut influencer le choix de localisation initial des immigrés, mais également l'intégration des nouveaux arrivants sur le marché du travail (Zavodny (1999) pour les Etats-Unis, McDonald (2004) pour le Canada). Concernant le choix de localisation, l'intérêt de se positionner dans une aire urbaine dans laquelle les pairs sont installés permet aux nouveaux arrivants de bénéficier d'un accompagnement des immigrés établis à la fois concernant les problématiques résidentielles mais également sociales et économiques (Calvo-Armengol and Jackson, 2004b, Dustmann et al., 2015).

Pour les immigrés, l'appui des pairs pour trouver un emploi peut à la fois être vertueux relativement à l'accompagnement des pairs pour s'intégrer sur le marché du travail (Munshi, 2003, Aslund et al., 2011), mais également vicieux si les immigrés occupent des emplois pour lesquels la qualité des emplois occupés est inférieure lorsque les immigrés ont trouvé leur emploi via un intermédiaire (Borjas, 2000, Chiswick and Miller, 2005) [5].

A partir d'une analyse alternative, l'approche de Borjas (2001), concernant le choix de localisation des immigrés, propose un modèle se basant sur la demande de travail. Selon Borjas (2001), le choix des immigrés concernant le lieu de résidence ne doit pas être motivé par la composition du voisinage (c'est-à-dire la présence de pairs), mais doit se baser sur les opportunités d'emplois disponibles dans la région d'accueil. Les trois conditions à respecter pour assurer une bonne intégration des immigrés sur le marché du travail, selon Borjas (2001), sont les salaires élevés, un faible taux de chômage et des emplois disponibles.

Ces choix de localisation peuvent influencer l'adoption progressive des normes du pays d'accueil

4. Cependant, le papier de Grzymala-Kazlowska (2005) met en avant les limites liées à la concentration spatiale des immigrés. A partir de l'exemple des polonais installés à Bruxelles, ils montrent que les nouveaux arrivants ne sont plus acceptés au sein de la communauté lorsque le marché du travail est saturé

5. La qualité d'intégration des individus peut se mesurer à partir des revenus obtenus ou de la correspondance entre le niveau d'éducation des individus et le niveau d'éducation requis pour l'emploi occupé.

via les relations sociales entre les individus [6]. Les préférences des individus à échanger avec des individus ayant des caractéristiques similaires sont conceptualisées avec la notion d'homophilie (Calvo-Armengol and Jackson, 2004a, Golub and Jackson, 2010, Golub and Jackson, 2012). Appliqué à l'immigration, cela s'illustre avec des échanges plus nombreux entre personnes ayant une origine commune. De ce fait, la proportion de natifs dans le cercle social des immigrés est moins élevée que la proportion de pairs. En complément de cette notion, la composition des relations sociales des immigrés peut être impactée selon leur volonté d'intégration dans le pays d'accueil caractérisée notamment par l'attachement des immigrés à leur pays d'origine, mais également par la volonté d'adoption des normes et coutumes du pays d'accueil.

La relation entre le lien social avec le pays d'accueil et le pays d'origine a été formalisée avec un indicateur appelé *ethnosizer* (Constant and Zimmermann, 2003, Constant and Zimmermann, 2008). A partir d'une analyse factorielle intégrant des critères identitaires en lien avec les sociétés d'accueil et d'origine, les auteurs proposent une mesure de l'identité. L'intérêt de se concentrer sur les relations entre les immigrés et le pays d'accueil ainsi que le pays d'origine est de proposer différentes typologies des immigrés. Les catégories proposées prennent en compte à la fois l'attachement des immigrés aux normes et aux traditions de leur pays d'origine, mais également celles du pays d'accueil. En intégrant l'ensemble de ces critères dans l'analyse, il est possible de calculer une distance identitaire entre les immigrés et les sociétés d'accueil et d'origine. Les quatre catégories sont l'intégration, l'assimilation, la séparation et la marginalisation (Constant and Zimmermann, 2008, Constant et al., 2009). L'intégration est caractérisée par un attachement à la fois au pays d'origine et au pays d'accueil. L'assimilation illustre un attachement des immigrés pour la société d'accueil mais un détachement envers la société d'origine. La séparation se définit par un maintien de la culture du pays d'origine en évitant les échanges avec les individus composant le groupe majoritaire de la société d'accueil. Enfin, la marginalisation désigne le cas où les immigrés rompent le lien avec leur culture d'origine sans s'intégrer à la société d'accueil.

Le comportement des immigrés dans le pays d'accueil associé à la composition des relations sociales des immigrés peut permettre à ces derniers d'acquérir ou non du capital humain dans le pays d'accueil [7]. Cette acquisition s'illustre notamment par l'adoption de normes du pays d'accueil

6. La concentration ethnique permet aux immigrés de diminuer le coût d'accès aux informations relatives à la fois au marché du travail mais également spécifiques à la société d'accueil (Maani, 2016)

7. L'adoption du capital humain du pays d'accueil dépend notamment du lien avec les natifs. Ces interactions sociales avec les natifs se caractérisent notamment par des mariages mixtes. Furtado (2012) and Furtado and Trejo (2013) analysent la relation entre le capital humain et les mariages mixtes. Leurs résultats montrent que les

mais également par une meilleure maîtrise de la langue du pays hôte. Or, l'acquisition de ce capital humain influence directement les performances économiques des immigrés sur le marché du travail (Van Tubergen et al., 2004, Zwysen, 2019). Ces échanges peuvent se caractériser soit par des relations avec le groupe majoritaire, c'est-à-dire avec les natifs, soit avec les groupes minoritaires composant la population de la société d'accueil.

Le maintien des contacts avec des pairs dans le pays d'accueil peut également être motivé par le souhait de cultiver les traditions et coutumes du pays d'accueil. Le processus d'intégration des immigrés peut être caractérisé par un attachement des immigrés de leur pays d'accueil. Les contacts répétés avec des pairs peuvent permettre aux immigrés de cultiver ces spécificités culturelles. Au-delà du maintien des spécificités culturelles avec les pairs, les relations sociales avec les individus de mêmes origines peuvent influencer l'intégration des immigrés sur le marché du travail (Lancee, 2016).

L'objectif de cette thèse est de déterminer quel est le rôle des relations sociales dans le processus d'intégration des immigrés et plus particulièrement l'intégration des immigrés sur le marché du travail. Les relations sociales ont un rôle ambigu, mais décisif dans le processus d'intégration des immigrés. L'effet réseau permet en effet de faciliter l'intégration sur le marché du travail (en termes d'employabilité) mais dans le même temps, l'effet réseau peut être déterminant dans la ségrégation des immigrés dans certaines professions. Appliquée au cas de la France, l'analyse de l'influence des réseaux sociaux est motivée par le passé migratoire et la composition hétérogène de la population immigrée (Brutel, 2014). Plus précisément, l'objectif est d'analyser l'hétérogénité de l'effet réseau selon l'origine des immigrés en prenant en compte à la fois l'accompagnement des relations sociales pour s'insérer sur le marché du travail, mais également la capacité des relations sociales à trouver un emploi pour lequel les immigrés sont qualifiés. De ce fait, l'intégration de l'inadéquation professionnelle des emplois dans notre analyse implique une prise en compte de la transférabilité du capital humain des immigrés.

1. Plan et apports de la thèse

Cette thèse s'articule autour de trois chapitres. Le premier chapitre se compose d'une revue de littérature basée sur les théories du choix migratoires ainsi que les contributions présentant les déterminants du processus d'intégration des immigrés dans les pays d'accueil. Les deux chapitres

individus composant les couples mixtes sont sélectionnés selon leur niveau de capital humain et plus particulièrement leur niveau d'éducation.

suivants présentent des analyses empiriques se concentrant sur la relation entre les réseaux sociaux et l'intégration des immigrés sur le marché du travail en France. Plus spécifiquement, le chapitre 2 analyse la relation entre le cycle économique et la mobilisation des relations sociales tandis que le chapitre 3 contribue à la littérature relative au déclassement professionnel en étudiant l'influence des relations sociales sur la probabilité d'être en situation de sur-éducation ou de sous-éducation.

1.1 Chapitre 1 - Théories du choix migratoire et processus d'intégration

Ce premier chapitre a pour objectif de présenter la littérature relative aux choix migratoires et à l'intégration des immigrés. Cette prise en compte de l'action de migration ainsi que du processus d'intégration dans le pays d'accueil se concentre sur l'aspect temporel de la migration. En effet, le projet migratoire des individus peut évoluer en fonction de l'intégration dans le pays d'accueil (De Haas et al., 2015, Snel et al., 2015). Une migration temporaire peut se transformer en un projet migratoire permanent et inversement.

L'objectif de cette revue de littérature est d'analyser le traitement des réseaux sociaux dans la littérature en considérant la migration comme un projet global caractérisé par le choix migratoire, mais également par le processus d'intégration des immigrés dans le pays d'accueil. L'intérêt de cette analyse est de montrer comment la littérature a fait évoluer la modélisation des théories du choix migratoires d'une approche individuelle vers une approche intégrant la sphère familiale puis sociale des individus.

Le premier thème développé dans ce chapitre est relatif aux théories du choix migratoire. La migration, au-delà de l'action de déplacement, est caractérisée par des facteurs pouvant être d'ordre individuels, familiaux, économiques ou sociaux. Plusieurs théories se sont succédées pour compléter les modèles de choix migratoire [8]. Les premiers modèles se sont focalisés sur les différentiels de revenus entre les lieux d'origine et de destination. L'objectif de ces derniers était de se focaliser sur l'exode rural et donc de modéliser les déplacements des individus depuis les zones rurales vers les milieux urbains. Avec l'évolution des flux de population au niveau international, les modèles se sont par la suite intéressés aux déplacements de population entre les régions situées dans des pays différents (Davis et al., 2002). Les individus sont positionnés au centre du modèle. Les choix des individus se réalisent dans une logique de maximisation de revenus.

L'intégration des relations sociales dans les théories des choix migratoires a été caractérisée par

8. Voir Sjaastad (1962) pour l'approche par le capital humain, Stark and Bloom (1985) pour la Nouvelle Economie de Migration plaçant en son centre le ménage comme déterminant de la migration.

l'introduction de la sphère familiale (Stark and Bloom, 1985). Même si les relations sociales se limitent aux relations familiales, l'originalité de cette approche se base sur le fait que la décision de migration ne dépend pas d'une maximisation des revenus au niveau individuel, mais se caractérise par l'intégration des caractéristiques du ménage (âge, composition familiale) afin de déterminer une stratégie de migration familiale. Malgré cela, les motivations économiques (basées sur la maximisation des revenus) restent le point central de cette approche. Malgré une prise de décision migratoire au niveau familial, les stratégies familiales de migration peuvent se caractériser soit par une migration de l'ensemble du ménage (pouvant être défavorable individuellement pour certains membres mais favorable collectivement), soit par une migration de certains membres composant le ménage dont le rôle de chacun des individus sera défini en fonction de leurs caractéristiques (migration pour les plus éduqués par exemple).

Dans un second temps, nous introduisons la littérature relative à la temporalité de la migration. Dans le cadre d'une distinction des migrations selon leur durée, nous avons deux catégories de migration : les migrations temporaires et les migrations permanentes (Dustmann and Görlach, 2016). Dans une logique de migration économique, les migrants potentiels définissent une durée de migration optimale leur permettant de maximiser leurs revenus (Dustmann and Kirchkamp, 2002). Cette durée de migration optimale peut se caractériser notamment par la décision d'une installation permanente dans le pays d'accueil. Il est à noter que le projet migratoire des immigrés peut évoluer après l'installation dans le pays d'accueil. Une migration temporaire peut devenir une migration permanente et inversement. Les déterminants pouvant impacter cette évolution de la durée de migration peuvent être liés aux performances économiques des individus sur le marché du travail dans le pays hôte. En effet, si les immigrés ont des performances économiques (en termes de revenu) inférieures aux revenus espérés initialement, les immigrés peuvent soit effectuer un retour anticipé dans leur pays d'origine si le différentiel de revenus s'accompagne également par des difficultés à intégrer le marché du travail, soit les immigrés peuvent prolonger leur durée de migration jusqu'à l'obtention du revenu espéré initialement (Bijwaard et al., 2014). Les périodes de chômage dans le parcours professionnel des immigrés dans le pays d'accueil ont un impact négatif sur la durée de migration et peuvent conduire les immigrés à des retours anticipés des immigrés dans le pays d'origine. A l'inverse, si le niveau de revenus obtenu dans le pays d'accueil est supérieur aux revenus espérés initialement, les immigrés peuvent s'installer de manière permanente dans le pays d'accueil ou bien prolonger leur séjour afin de profiter du différentiel de salaire positif entre le pays d'origine et le pays d'accueil (Bijwaard et al., 2014).

L'introduction du capital humain est fondamentale dans la compréhension du processus d'intégration des immigrés dans le pays d'accueil (Holzer, 2016). En effet, la transférabilité des diplômes et des expériences professionnelles acquis dans le pays d'origine, la maîtrise de la langue du pays d'accueil sont des facteurs déterminants dans le processus d'intégration des immigrés (voir Lewis (2011) pour l'influence des coméptences linguistiques, Chiswick and Miller (2009b) pour la transférabilité du capital humain entre le pays d'origine et le pays d'accueil). Si les expériences professionnelles et éducationnelles ne sont pas reconnues dans le pays d'accueil, la probabilité d'occuper un emploi pour lequel l'immigré est sur-éduqué augmente.

A travers l'ensemble des contributions présentées dans cette revue de littérature, nous montrons que la temporalité de la migration est un élément fondamental dans la compréhension du choix migratoire, mais aussi dans le processus d'intégration des immigrés. En effet, une longue période de migration dans le pays d'accueil ne signifie pas nécessairement que les immigrés sont intégrés dans la société d'accueil. Le processus d'intégration des immigrés est déterminé à la fois par des facteurs individuels, économiques et sociaux. Les interactions sociales doivent être prises en compte tant dans le choix migratoire que dans le processus d'intégration des immigrés dans le pays d'accueil. Il est à noter que selon l'origine des individus, la structure du réseau actuel dépend du passé migratoire dans le pays d'accueil. Les effets des relations sociales peuvent donc être hétérogènes selon l'origine.

1.2 Chapitre 2 – Effets réseaux et cycle économique en France

L'objectif de ce chapitre est d'analyser la relation entre le cycle économique et les relations sociales des immigrés dans une perspective empirique, avec une application au cas de la France. L'analyse de cette relation se situe dans le prolongement de la littérature relative au rôle des intermédiaires dans la transmission des opportunités d'emploi (Granovetter, 1995, Addison and Portugal, 2002, Brown et al., 2016). La mobilisation d'un tiers pour trouver un emploi permet aux entreprises de réduire les coûts de recrutement par rapport à une méthode traditionnelle. Au-delà de ces avantages tant pour les travailleurs que pour les entreprises, la transmission des opportunités d'emploi contribue à réduire les asymétries d'information sur le marché du travail en envoyant un signal positif de la qualité de l'employé à la firme. Ce type de recrutement permet de réduire la sélection adverse entre les entreprises et les travailleurs (Dariel et al., 2019). En effet, en recrutant les nouveaux employés par l'intermédiaire des travailleurs déjà présents dans l'entreprise, les firmes peuvent recruter des individus ayant des caractéristiques similaires à leurs employés si ces derniers

sont homophiles. En effet, puisque l'homophilie caractérise la préférence des individus à interagir avec des personnes ayant des caractéristiques similaires, les individus nouvellement recrutés auront probablement des caractéristiques (des qualités pour l'emploi) similaires aux travailleurs déjà en emploi. Ce mode de recrutement peut permettre aux entreprises de diminuer les coûts associés à l'arrivée de nouveaux travailleurs au sein des firmes. Burks et al. (2015) montrent que le recrutement via un intermédiaire permet aux entreprises de diminuer les coûts liés au recrutement, c'est à dire le temps passé à recruter un nouvel employé, de réduire les formations du nouvel arrivant dans l'entreprise et garantie une certaines stabilité parmi les employés recrutés).

Ce chapitre étudie plus précisément la façon dont le rôle des réseaux sociaux peut se modifier avec le cycle économique. Le cycle économique, caractérisé par des périodes de croissance ou de récession, a un impact direct sur le marché du travail. En période de récession, un choc sur la demande de travail a pour effet une diminution du nombre de postes vacants accompagnée d'une augmentation du taux de destruction d'emploi. En revanche, en période de croissance économique, les offres d'emploi sont plus nombreuses et permettent aux travailleurs de s'intégrer plus facilement sur le marché du travail. Par conséquent, le recours à des tiers peut permettre aux travailleurs de s'intégrer plus facilement sur le marché du travail pendant une période de récession afin de pallier à la rareté de la demande de travail (Galenianos, 2014).

Pour notre analyse empirique, nous utilisons les enquêtes Emplois de l'INSEE pour les années allant de 2003 à 2012. L'objectif de notre analyse empirique est d'étudier l'évolution de l'effet réseau le long du cycle économique. Pour cela, nous utilisons deux indicateurs pour mesurer l'effet réseau. Le premier indicateur se base sur la probabilité de trouver un emploi grâce à un tiers. Cet indicateur nous informe sur la façon dont le travailleur a trouvé un emploi par l'intermédiaire de liens directs. L'intermédiaire peut être un membre de la famille, un ami ou un collègue. Les individus sont interrogés directement sur cette question.

Le deuxième indicateur est construit en fonction de l'origine des individus. Comme nous l'avons mentionné précédemment, en fonction de leur origine, les immigrés bénéficient d'un réseau social plus ou moins important dans le pays d'accueil [9]. A partir de ce constat, nous avons construit un indicateur basé sur l'externalité positive des immigrés établis, selon l'origine des individus et le lieu de résidence (au niveau régional). Pour cela, nous avons classé l'ensemble des emplois selon

9. Les relations sociales, composées d'immigrés établis, permettent aux nouveaux arrivants de bénéficier d'un accompagnement et d'un soutien par leurs pairs. Cet accompagnement peut se caractériser par la transmission d'opportunités d'emplois dans lesquels les immigrés établis se sont spécialisés (Patel and Vella, 2013a).

la distribution des emplois des immigrés établis. Ensuite, nous calculons une distance entre le classement de l'emploi occupé par l'immigré et le classement de l'emploi dans lequel la proportion d'immigrés est la plus élevée [10].

L'intérêt de cet indicateur est de pouvoir caractériser l'externalité positive des immigrés établis sur la transmission des offres d'emplois entre les immigrés. Tandis que le premier indicateur ne nous permet pas de capturer des informations relatives à l'origine des tiers, cet indicateur nous informe potentiellement sur l'influence des pairs sur les choix d'occupation des immigrés.

Ces deux indicateurs sont utilisés comme variables dépendantes dans notre analyse économétrique. Pour identifier le cycle économique, nous n'utilisons pas la probabilité de destruction d'emploi, mais la probabilité de trouver un emploi [11]. Cela se justifie notamment par la rigidité du marché du travail français relativement aux marchés anglo-saxons. Hairault et al. (2015) montrent que les déterminants contribuant à expliquer les fluctuations du taux de chômage ont évolué entre les années 90 et les années 2000. Alors que les taux de transitions entre l'emploi et le chômage contribuant à expliquer les fluctuations du taux de chômage étaient partagés entre les entrées et sorties du chômage dans les années 90, à partir des années 2000, les fluctuations du taux de chômage ont pour contribution principale le passage d'une situation de chômage à une situation d'emploi. Hairault et al. (2015) notent cependant que la France, comparée aux pays anglo-saxons, connait un taux de transition plus faible. Etant donné ces résultats, nous utilisons le taux de retour en emploi pour identifier le cycle économique.

D'une manière générale, nos résultats montrent que le rôle des relations sociales n'est pas constant selon le cycle économique. En période de récession économique, lorsque la probabilité de trouver un emploi diminue, trouver un emploi grâce à un intermédiaire (lien direct) augmente. Ces résultats sont significatifs lorsque l'on considère l'ensemble des immigrés ainsi que les immigrés ayant moins de trois ans d'ancienneté dans leur emploi.

Concernant le second indicateur caractérisant la distribution occupationnelle des immigrés par région, le constat de l'accompagnement des pairs en période de récession économique est confirmé

10. Ce classement dépend de l'origine des immigrés et de la région de résidence.

11. La probabilité de trouver un emploi est calculée à partir de la probabilité de transition des individus d'une situation de chômage à une situation d'emploi. Nous calculons la probabilité de trouver un emploi selon Shimer (2012). En effet, nous calculons dans un premier temps les transitions de position sur le marché du travail pour chaque trimestre puis nous calculons une moyenne pour chaque année, chaque région. Par conséquent, nous devons corriger le biais correspondant à la différence de probabilité de transition entre les temps discrets et les temps continus avec la méthode de Shimer.

avec une augmentation de la probabilité de trouver un emploi dans lequel la proportion d'immigrés est plus élevée en période de récession économique.

1.3 Chapitre 3 – Déclassement et surclassement professionnel et effets réseaux en France

Ce chapitre analyse la relation entre l'inadéquation professionnelle et l'effet réseau pour la population immigrée. L'objectif est de mettre en évidence, pour le cas de la France, les déterminants de l'intégration des immigrés sur le marché du travail et plus particulièrement le rôle des relations sociales sur la correspondance entre le niveau d'éducation requis des emplois occupés par les immigrés et le niveau d'éducation individuel. L'inadéquation professionnelle se définit comme étant une notion de déséquilibre entre les compétences individuelles (éducationnelles) et les compétences requises ou observées pour l'emploi occupé par les travailleurs.

L'inadéquation professionnelle des immigrés est notamment caractérisée par la transférabilité du capital humain. Le capital humain des immigrés peut être composé de compétences éducationnelles et/ou professionnelles acquises dans le pays d'origine. Cependant, l'ensemble de ces compétences peut ne pas être reconnu dans la société d'accueil (Chiswick and Miller, 2009c).

La méthode mobilisée dans ce chapitre, pour identifier l'inadéquation professionnelle, est une approche statistique et se base sur les observations individuelles (McGuinness, 2006, Leuven and Oosterbeek, 2011). Dans un premier temps, le niveau d'éducation moyen (ou médiane) est calculé pour chaque emploi ainsi que l'écart-type. Ensuite, nous comparons le niveau d'éducation individuel au niveau d'éducation médian observé pour chaque emploi. Dans le cas d'un niveau d'éducation individuel supérieur au niveau d'éducation médian observé dans l'emploi plus l'écart-type, nous considérons que l'individu est en situation de sur-éducation. A l'inverse, si le niveau d'éducation individuel est inférieur au niveau d'éducation médian observé moins l'écart-type, nous considérons que l'individu est sous-éduqué. Cette situation de mauvais appariement (sous-éducation) est caractérisée par la valorisation de compétences non-éducationnelles des individus sur le marché du travail. De ce fait, pour occuper un emploi pour lequel les travailleurs n'ont pas le niveau d'éducation requis, ces derniers doivent valoriser des compétences non-éducationnelles (professionnelles, talent spécifique à une origine) afin d'être recruté dans cet emploi.

Concernant l'effet réseau, l'application de cette analyse au cas de la France se justifie par son passé migratoire. En effet, même si la composition de la population immigrée en France est hétérogène, celle-ci est caractérisée par une large proportion d'immigrés en provenance d'Europe du

Sud ainsi que d'Afrique du Nord (Lê and Okba, 2018). Ces vagues migratoires étant relativement anciennes, ces groupes d'origine ont pu structurer des réseaux sociaux permettant notamment aux nouveaux arrivants de bénéficier d'un accompagnement des immigrés établis lors de leur arrivée en France (Verdugo, 2014). Cependant, ces groupes d'origine ont connu des processus d'intégration différents depuis l'arrivée des premières vagues migratoires. Tandis que les immigrés en provenance d'Afrique du Nord sont majoritairement restés concentrés au sein des grandes aires urbaines, les immigrés en provenance d'Europe du Sud ont fait évoluer leur choix de localisation similairement aux natifs (Brutel, 2014). Nous pouvons supposer que les intermédiaires ainsi que l'influence de l'environnement résidentiel peuvent avoir une effet hétérogène selon les origines à la fois sur la transmission des offres d'emploi ainsi que la qualité des opportunités d'emplois transmises.

L'objectif de ce chapitre est de contribuer à la littérature relative au mauvais appariement sur le marché du travail en étudiant la relation entre l'effet réseau et la probabilité d'être en situation de sous-éducation/sur-éducation (Chort, 2017 ; Kalfa and Piracha, 2018). Pour cela, nous intégrons des variables relatives à la fois à l'environnement social (composition du voisinage) et économique (pourcentage de chômeurs dans l'aire urbaine). L'idée sous-jacente est de tester empiriquement les contributions de Loury et al. (2005) and Bentolila et al. (2010) caractérisant l'influence des pairs dans les choix d'occupation des immigrés. En effet, les auteurs montrent que l'effet réseau, concernant les choix d'occupation, peut primer sur les compétences éducationnelles des immigrés. Deuxièmement, du fait de l'ancienneté des vagues migratoires des Européens du Sud et des Maghrébins en France ainsi que des processus d'intégration différents pour ces deux origines au cours de ces dernières décennies (notamment concernant les choix de localisation, Brutel, 2014), nous étudions plus en détail l'influence de l'environnement économique et social de ces deux origines sur la probabilité d'être en situation de mauvais appariement sur le marché du travail.

Notre travail s'appuie sur les données françaises de l'enquête Emploi de 2005 à 2012. Nous distinguons neuf origines différentes : Nord-Européens, Sud-Européens, Européens de l'Est, Nord-Africains, Sub-Sahariens, Turcs, Asiatiques du Sud-Est et Autres (ce dernier groupe est composé d'immigrés du reste du monde).

L'analyse économétrique se focalise sur l'ensemble des immigrés, les Maghrébins et les Sud-Européens. Deux modèles sont implémentés : un Probit et un Probit bivarié. L'intérêt du Probit bivarié est d'endogénéiser l'effet réseau en intégrant des variables caractéristiques du lieu de résidence des immigrés. Pour cela, nous estimons simultanément la probabilité d'être en situation de mauvais appariement sur le marché du travail (sur-éducation ou sous-éducation) ainsi que la

probabilité de trouver un emploi grâce à un intermédiaire.

Le premier résultat ressortant de l'analyse concerne la relation entre le fait de trouver un emploi grâce à un intermédiaire et la probabilité d'être en situation de sur-éducation ou de sous-éducation. Même si les intermédiaires influencent la qualité des emplois occupés par les immigrés, le rôle des intermédiaires peut être soit positif, soit négatif selon les situations. Concernant les échantillons composés des individus sur-éduqués, les intermédiaires ont un rôle positif dans l'intégration des immigrés sur le marché du travail. Trouver un emploi grâce à un intermédiaire permet de diminuer la probabilité d'être en situation de sur-éducation. A l'inverse, concernant les estimations composées des immigrés en situation de sous-éducation, l'intermédiaire ne permet pas aux immigrés de mettre en avant leurs compétences non-éducationnelles sur le marché du travail. Les immigrés ayant trouvé un emploi grâce à un intermédiaire ont une probabilité moins élevée d'être en situation de sous-éducation. Ce résultat suppose que le talent des immigrés, lorsqu'ils sont en situation de sous-éducation, est davantage valorisé de manière individuelle ou bien via les méthodes de recherche d'emploi traditionnelle.

Le second résultat est que la composition du voisinage influence à la fois la probabilité de trouver un emploi grâce à un intermédiaire et indirectement la probabilité d'être en situation de sur/sous-éducation. La composition de la population et plus particulièrement la proportion de la part d'immigrés dans l'aire urbaine a un effet significatif lorsque l'on considère l'ensemble des immigrés, les Européens du Sud et les Maghrébins. Ce résultat confirme notamment la notion d'homophilie lorsque celle-ci est appliquée à la population immigrée.

Ces trois chapitres placent au centre de l'analyse la relation entre l'effet réseau et l'intégration des immigrés sur le marché du travail. Le rôle des relations sociales peut à la fois être un facteur permettant de limiter les difficultés d'intégration des immigrés notamment lorsque l'économie du pays d'accueil est en récession, mais peut également être déterminant dans la qualité des emplois occupés par les immigrés. Alors que nos résultats montrent que les relations sociales permettent de faciliter l'accès à l'emploi lorsque la compétition sur le marché du travail est la plus forte (en période de récession économique), l'influence des relations sociales sur la qualité des emplois transmis est plus ambigu. Même si le fait de trouver un emploi grâce à un intermédiaire permet de diminuer la probabilité d'être en situation de sur-éducation, dans le même temps, le réseau social ne permet pas aux immigrés de valoriser leurs compétences non-éducationnels sur le marché du travail. Il est à noter que la mesure de l'inadéquation professionnelle implique que plus un immigré a un niveau d'éducation élevé, plus la probabilité d'être en situation de sur-éducation augmente et

inversement concernant les situations de sous-éducation. Or, nous avons noté que le rôle des relations sociales n'était pas identique selon les situations de sur-éducation et de sous-éducation. De ce fait, pour une même origine, la mobilisation des réseaux sociaux peut également être influencée par les caractéristiques individuelles des immigrés. En termes d'implication concernant les politiques publiques d'intégration, ces résultats caractérisent la difficulté des autorités à proposer une solution d'accompagnement des nouveaux arrivants globale à une population pour laquelle chaque caractéristique individuelle permet de contribuer à expliquer les performances économiques sur le marché du travail dans le pays d'accueil.

Chapter 1

Migration choice theories and integration process: A review

1. Introduction

Migration is a major economic and social issue. Over the last decades, population flows have steadily increased. These flows lead to demographic changes both in host countries and in countries of origin. These demographic changes have been the subject of increasingly important media and scientific treatment. Indeed, even if the migration action can be summed up as an individual act, it implies changes in the composition of countries. The management of these population flows is characterised, from a political point of view, by the implementation of action in terms of integration for the receiving countries and the management of emigration in the host countries (See Reinsch (2005) for integration policies and De Haas et al. (2019) for emigration policies).

The originality of the litterature related to the migration lies in the fact that it can be analyzed at both the macroeconomic and microeconomic levels [1]. Indeed, the effect of population flows has consequences both in terms of employment, culture and housing of the host and home countries. The migration decision can also be analyzed at the individual level. This decomposition lies in the understanding of the decision-making process including factors related to individual characteristics, family and social environment and socio-economic context of the home and host countries (Cortes and Tessada, 2011).

The understanding of the migration decision needs to be included into a decision-making process. Migration action is not limited to the simple decision of migration but needs to be included into a process where time has to be taken into account. Immigrants have the possibility to make a permanent migration or a temporary migration (Dustmann, 1993; Dustmann and Görlach, 2016).

These approaches make it possible to understand the dynamics created by the migration as well as to account for all the elements that can influence - both negatively and positively - the success of this migration action. The purpose of this literature review is to highlight recent theoretical and empirical advances in analyzing the process of migration and integration of immigrants. We also seek to show why the introduction of economic and social factors in the migration decision models but also integration processes made it possible to understand the economic performance of immigrants in the host countries.

The arguments proposed to take environmental factors into account lie in the discrimination and access to markets in the host country, namely the housing market but also the labor market. Integrating a society requires above all an understanding of the norms of the host country. As a

1. See Kiguchi and Mountford (2013) or Kiguchi and Mountford (2019) for analyses of the effect of immigration on macroeconomic variables such as GDP, consumption or unemployment

result, relying on a social network already in place allows newcomers to benefit from support during establishment. However, this facility in the host country may force immigrants to make concessions regarding location choices and occupational choices (see (Maani, 2016) for the effects on the location choice and (Van Tubergen et al., 2004; Zwysen, 2019) for the effects on the occupational choices). These imbalance situations have a direct impact on the situation of immigrants in the labor market.

The second interest in integrating both migration choice theories and work on integration processes lies in the fact of insisting on this notion of dynamics existing in the action of migration. The migration action does not stop once an immigrant has arrived in the place of destination. On the contrary, initial migration plans can be modified by the integration of immigrants into the host country. This can be characterized either by a reduction in the duration of migration or by the will to settle permanently in the host country (Bijwaard et al. (2014) analyse the relationship between the level of wages obtained in the host country and the duration of migration).

To answer these questions, in the first section, we deal with the theoretical and empirical contributions which have attempted to identify the determinants of migration choice, as well as those of integration. Whether the migration is internal or international, the potential migrant considers the costs and benefits that his or her action - or inaction - can bring (Sjaastad, 1962). The starting point of Sjaastad's analysis is based on the cost / benefit analysis carried out by immigrants between the decision to stay and the action to migrate. Individual decision-making was questioned in the late 1980s. Stark and Bloom (1985) and Stark (1991) distinguished themselves from the individualistic approach of the neoclassical theory by integrating family strategy as a decision-making process of migration. This consideration of the family sphere has highlighted the first social links in the process of migration.

In the second section, we focus on the temporality of the migration. This approach made it possible to characterize the act of migration as being a failure, or a strategy put in place by the individuals to maximize their outcomes. Beyond these successes and failures, it highlights the behaviors that migrants could have in host countries (Dustmann, 2000; Dos Santos and Postel-Vinay, 2005; Dustmann and Görlach, 2016). The incentive for immigrants to invest in human capital specific to the host country, adopt the standards of the host country depends on the duration of migration initially expected.

In our third section, we focus on the way in which the integration process has been considered in the literature. We begin our development with the definitions of the integration from a policy and research approches. Regarding the academic approach, we present the measures used to identify

the key parameters in the measurement of the integration of immigrants from a societal point of view but also economic. In a second step, we introduce the set of individual, residential and social factors influencing the integration process. As a result, different measures of performance are introduced, namely the situation of immigrants in the labor market, the occupational choices, but also the quality of jobs held by immigrants through the analysis of the occupational mismatch situations.

2. Determinants of the migration

2.1 Definition

The migration can be defined as a movement of an individual from one geographical area to another. This action can be characterized either by a migration within a same country, i.e. a migration from rural areas to urban areas, or by migration between countries. According to the International Organization for Migration, migration is defined as "*the movement of a person or a group of persons, either across an international border, or within a State. It is a population movement, encompassing any kind of movement of people, whatever its length, composition and causes; it includes migration of refugees, displaced persons, economic migrants, and persons moving for other purposes, including family reunification*"[2].

This definition of the IOM focuses mainly on the displacement action as well as on the geographic characteristics of the territory. Indeed, the movement of immigrants is characterized by a crossing of the border. Beyond this displacement, the definition also focuses on the causes of migration across different categories of immigrants. All of these categories are characterized by climatic, political, individual or economic factors.

The study of migration in economics - among others - aims to understand what are the motivations of individuals to perform this act. The reasons for migration may be various: migration may be constrained or not, in a revenue maximization approach (Sjaastad, 1962), economic reasons may motivate individuals to perform this action, migration may also be forced in cases of natural disasters or persecutions, conflicts (Haug, 2002; Saha, 2017). If we focus on unconstrained migration, the aim of this action is to improve the standard of living, the welfare of the individual or the household.

In order to understand the motivations of this migration choice, it is necessary to characterize

2. See International Organization for Migration, `https://www.iom.int/key-migration-terms`

the geographical areas of origin and reception. One of the first models based on the characterics of the geographical areas has been modeled by Lee (1966). Lee (1966) presents the geographical factors that can influence the migration decision of individuals. For this, Lee (1966) focused on the factors of attraction and repulsion for each area. The places of origin and destination are associated with positive and negative determinants that may be specific to each individual or shared between them.

The push-pull model attributes, at the places of origin and reception, attractive characteristics. The repulsive factors can be climatic hazards, wars, but these factors can also be of economic order like a high rate of unemployment. These factors are taken into account by individuals in their decision to migrate. The pull factors attract people to the areas. This may be due to job opportunities available on the job market. The attraction factors, from an environmental point of view, are close to the concept of amenity, which is defined as being the natural (or cultural) specificities available on a territory and being appreciable for individuals. As a result, each territory is represented, for each individual, as an aggregation of positive and negative factors that may or may not attract potential migrants.

The social network, if we define this term as a spatial concentration of individuals from the same origin on a territory, is not taken into account in the work of Lee (1966). However, from an informational point of view, the presence of immigrants living in a host territory allows newcomers to benefit from information relating to the socio-economic characteristics of the territory (Dustmann et al., 2015). This concentration can benefit newcomers and this can be perceived as a factor of attraction for them (Ojo and Shizha, 2018).

Migration is not just about people choosing to move. Indeed, it is necessary to take into account the policies that can constrain migration flows. Migration policies can have an influence at three different levels.

The first field of application of policies is relative to the quality of the immigrants. Immigrants are selected according to their educational level. This strategy allows governments to respond to a skill gap in the labor market. The second field of application focuses on the quantity of the immigrants allowed to come in the host country. These policies are implemented thanks to the introduction of visas, residence permits. The number of these permits, visas are limited each year and can be conditioned to the educational level and skills of immigrants (Mayda, 2006). Then, the third field of application of immigration policies is relative to the duration of the migration. The presence of the immigrants in the host country can be limited to some months, a year. This

duration limitation could have an influence on the integration of the immigrants into the host society. Moreover, this limitation could influence the economic performance of the immigrants (Beine et al., 2001).

These three fields correspond to the migration policies implemented in the host countries. On the other hand, in the case of emigration, some countries may prohibit or limit the exit of territory of its nationals. [3].

Lee (1966) names these barriers as "*intermediate obstacles*". When there is a crossing of borders, we enter the framework of international migration. As a result, natural or political barriers may limit this migration. The freedom of movement of individuals can therefore be constrained.

This definition, paralleled with the push-pull model of Lee (1966), makes it possible to fix the basics of our approach. Indeed, in the context of an unconstrained migration, this action is presented as an individual decision. However, this action may be limited in its application for political or geographical reasons. Migration therefore selects individuals according to their characteristics and their ability to overcome migratory constraints.

2.2 Familial strategy of migration decision

2.2.1 An individual or a family decision?

Initial work on the migration decision highlighted the existing wage differentials between two geographical areas (Sjaastad, 1962; Raggl, 2019). Before being examined in the context of international migration, studies on wage differentials focused on rural-urban migration. Based on these differences in income between regions, Sjaastad (1962) presents a theory of migration based on human capital. The developed model puts in opposition the costs and benefits to explain the migration decision. The individual, at the center of the analysis, considers migration as an investment in human capital.

The decision is based on a rational choice and it is assumed that migrants locate where wage

3. We do not develop this situation in the paper even if it could have an influence on the selection of the immigrants and the educational level of these latters.

differentials are positive. Consider C the costs of the migration [4]:

$$C < W_2 - W_1 \tag{1.1}$$

The variables W_1 et W_2 correspond respectively to the incomes in the region of origin and the host region. If equation 1.1 is verified, the individual takes the decision to migrate. If migration costs are greater than the wage differentials between the two zones, there is no migration.

As an extension of this model, through a neoclassical approach, Mincer (1978) introduced the family sphere. The approach is similar to the individual model proposed so far. Indeed, Mincer (1978) considers that the migration decision is taken at the household level from the earnings of each of the component members. If the household migrates, it means that the family income in the host country is higher than the income earned in the country of origin. The approach of Mincer (1978) is to aggregate all household earnings in both the country of origin and the host country. As a result, if the household decides to migrate and there is a loss of income for an individual in the household between the country of origin and the potential host country, this means that there is compensation through other members of the household.

According to the equation 1.1, from the moment when migration costs are lower than gains of migration, which correspond to the differences of wages between the host area and the home area. However, limiting the model to a simple question of costs and salary opportunities is reductive in modeling migration choice. What is the role of the migration policies? Can migrants make errors of anticipation? What is the role of the environmental and economic factors?

Using US data, Sjaastad (1962) shows that in the State of Mississippi, 62,500 people emigrated from this area but at the same time, 51,900 people immigrated during the 12 months preceding the 1950 census. These differences in behavior are not consistent with the previous approach based on the cost and benefit differential.

To explain these differences in behavior between individuals, Sjaastad (1962) states the following three points. It begins by saying that focusing on net migration is not enough to explain income differences between individuals. In a second point, Sjaastad (1962) proposes a decomposition of the population according to the age and the profession in order to match the predictions of the migration models and empirical evidence. This consideration of heterogeneity in the individual characteristics

4. Beyond the financial costs of travelling between two territories, Sjaastad (1962) argues that migration implies psychic costs. These costs are related to the reluctance of migrants to leave family and friends. These costs can also be associated with the adoption of the host country language.

makes it possible to match the possible salary opportunities in each region according to individual characteristics. Finally, Sjaastad (1962) puts forward that even if a migration decision can be the rational behavior of an individual from an economic point of view, we can observe an immobility of the individuals. Even if there is a positive wage differentials between home and host countries, individuals may decide not to migrate (Borjas, 2014). This immobility can be explained by non-monetary costs that cannot be borne by potential migrants. These costs may be characterized by a cultural distance between the country of origin and the host country, climatic reasons, an attachment to the country of origin.

Sjaastad (1962) evokes a period of adaptation more or less long that the individual can have in the host country allowing him or her to find a job: this corresponds to the adaptation of the individual to the local culture as well as the barrier of the language can influence the duration of this period. A psychological cost is also added to these non-monetary costs. These come closer to the attachment that individuals have towards their country of origin, the intensity of the relations that they have with their entourage present either in the country of origin, or in the host country. This attachment is unique to everyone and makes it possible to understand the fact that individuals who have already migrated a first time are more likely to migrate again.

To understand the reasons for the non-migration of some of the individuals while the wage difference between two areas may be large, Borjas (1987) includes a discount rate to equation 1.1 :

$$C = \frac{W_2 - W_1}{r} \tag{1.2}$$

C is still the migration cost, W_i is the revenue associated with the migration when $i = 2$ and earnings when there is no migration with $i = 1$. r is the discount rate. The migration decision is made by agents in a home area that have an income of W_1 and want to migrate to an area where income is equal to W_2.

The migration treated in this model is presented as an investment decision. Individual characteristics such as age and level of education as well as the characteristics of the host and origin zones, such as the level of unemployment or the distance between the two geographical zones, are expected to influence the migration decision of individuals.

This selection of individuals concerning the migration decision has its origins in the Roy (1951) model, formalized later by Borjas (1987) and Borjas (1992). The objective is then to be able to differentiate the selection of individuals making the decision to migrate from the return on

investment of their human capital. As a result, the log wage is formalized as follows:

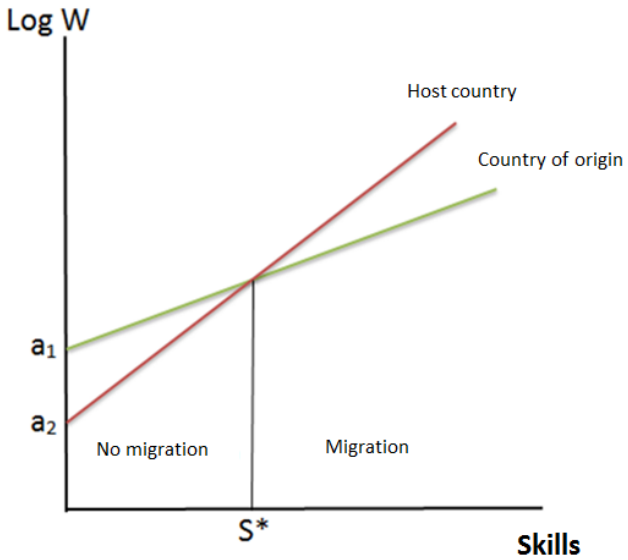
$$logW_i = a_i + p_i S \tag{1.3}$$

a_i is the constant of an individual's income for a given skill level in the country i. $p_i S$ refers to the return on investment of skills in the country i. The migration decision is conditioned by the equation:

$$a_2 + p_2 S > a_1 + p_1 S \tag{1.4}$$

If the skills returns are higher in the host country than in the country of origin ($p_2 > p_1$), this refers to a positive selection of immigrants. Graphically, this scenario is given by the relationship between skill level and wage logarithm presented in Figure 1.1). This means that if individuals have higher skills returns in the host country ($p_1 < p_2$), there is a selection of immigrants according to their skill level. Agents intending to migrate must therefore exceed a limit level of skills to perform the migration.

Figure 1.1 – Positive selection of immigrants into the host country



Conversely, if the skills returns are lower in the host country compared to the skills returns in the country of origin ($p_2 < p_1$), this corresponds to the case of a negative selection of immigrants.

In the case of a negative selection of immigrants, the limit level of skills is not exceeded by the individuals of the host country. If individuals exceed the level of educational skills, the return in terms of human capital is higher in the country of origin, there is no incentive to emigrate.

So far, we have ignored in equation 1.3 the migration costs. It should be noted that these costs, whether monetary or not, are proportional to the distance between the region of origin and the host region. The closer the two regions are, the greater the knowledge of the labor market of the host country. However, social networks can influence the non-monetary costs. In fact, if a network is established between a home region and a host region, then established immigrants can share their knowledge of the host country with newcomers.

The migration theories introduced in this section provide the basis for both the definition of migration as well as the foundations of the economic literature on the topic of migration. Contributions concerning the selection of immigrants are crucial in understanding the integration process of immigrants in host societies. This selection of immigrants is directly related to human capital theories. Contributions in the literature consider both this human capital but also introduce social capital. Social relations of individuals and the environment directly or indirectly influence migration choices and the process of integration of immigrants into host societies.

2.2.2 The New Economics of Labor Migration

The neoclassical approach presents the migration choice as an individual decision. In the 1980s, another trend emerged and no longer regarded migration as an individual choice. The NELM challenges the individualistic approach proposed by the neoclassical movement. The NELM highlights the fact that the decision to migrate results from a family, collective choice. These works were the first to introduce social relations into the process of migration choice. The NELM approaches migration as a strategy and not as a motive. If an individual migrates, this migration should be seen as the consequence of a family strategy. The positive wage differential, at the individual level, between the country of origin and the host country is no longer the only motivation for migration. This strategy is positioned in a collective framework characterized by problems related to household liquidity constraints (Stark, 1978).

Stark and Bloom (1985) based their development on the role of migration in a household. This family migration strategy ensures a minimum income for households through diversification of income risk or to compensate for the lack of access to the credit market. The idea underlying this approach lies in the motivations of individuals to migrate and more specifically to explain the

transfer of funds observed between the host areas and the areas of origin. If only one member of a household migrates, it provides a minimum income for household members remaining in the host country.

Beyond the family circle, Stark and Bloom (1985) specify the important role played by the networks in the migration decision, the expectations of income and performance in the labor market of the host country following this decision. They place these elements in a framework of game theory: "*a migrant who offers to cooperate in his trade with anyone in the first game (...) will tend to be better off than a native who never behaves cooperatively, provided a sufficiently high proportion of trades by migrants are conducted among migrants. This result provides an interesting explanation for the observation that new migrants are assisted by those who have migrated earlier; one good way of having a higher proportion of all trades conducted among migrants when there are few of them is to have additional migrants*"(Stark and Bloom, 1985, p. 175). This reasoning allows the authors to point out the incentive of established immigrants to help newcomers when they move to the host country.

A related approach proposed by Stark (1991), based on Runciman (1966), is to justify migration from relative deprivation. Relative deprivation is based on the comparison of income between two distinct groups.

Runciman (1966) defines this concept from four conditions. Consider X as an average income obtained by a social group to which the individual refers: "(1) the individual does not have X; (2) the individual notices that other people have X; (3) the individual wants X; (4) the individual realizes that it is feasible to obtain X". Because of the comparison between individuals, people could have an incentive to migrate to increase their earnings.

This approach assumes that if large inequalities are found between members belonging to the same group, the relative deprivation is higher for the households with the lowest incomes and this may increase their willingness to migrate in order to overcome this deprivation. Beyond maximizing their personal income to increase their well-being, increasing their income to reduce the deprivation that households may have relative to others also bring them higher satisfaction. As a result, Stark (1991) considers the following utility function for households: $U(y_j^i, RD_j^i)$. This depends both on the absolute income y_j^i of households and the relative deprivation (RD_j^i).

$$U(y_2^i, RD_2^i) > U(y_1^i, RD_1^i) \tag{1.5}$$

With (y_2^i, RD_2^i) respectively the income and relative deprivation associated with the migration

and (y_1^i, RD_1^i) the income and relative deprivation associated with the absence of migration.

Stark (1991) applied their model to Mexican data [5]. Their study covers a rural area. Indeed, the underlying idea is that, in case of variation of income in a village, the surrounding villages can modify their behavior in order to make up for this difference in income. The role of public policies in the country of origin therefore becomes a determining factor in the choice of migration. Empirically, the authors find that the greater the relative deprivation and the difference in absolute income, the more frequent international migrations [6].

The approach proposed by the NELM is not to be considered independently of the neoclassical approach. The second approach considers the maximization of income as a determinant of migration. The reasons for making the migration choice are highlighted in this approach. NELM considers the social environment as the level of analysis to be taken into account to model migration decision making. Migration is a way for households to ease the liquidity constraint if access to the credit market is restricted, for example, or to remove uncertainty about future rural income. Income is the key element in both approaches to motivate migration. Neoclassicals highlight income differentials between regions for individuals with common characteristics while the income allows to fill the relative deprivation between social groups or is able to play an insurance role within the framework of the NELM.

2.3 Temporary or permanent migration?

Migration is not limited to an analysis of the spatial framework concerning the characteristics of the host and origin areas. Migration is also part of the life cycle of individuals. The time dimension is related to the migration decision as well as to the migration process as a whole (Dustmann and Görlach, 2016). We define the migration process as the period between the will to migrate (including the calculation of expected eargnings associated with migration) and either return to the country of origin as part of a temporary migration or integration into the host society as part of a permanent migration.

Migration motivations can be based on higher wage opportunities in a foreign country. Individuals may also view migration as an investment in human capital in order to return to their home country once they have acquired the specific skills or when they have reached the expected level of

5. Their data were collected in 1982 in the Patzcuaro region of Michoacan State.

6. In Rivera (2017), authors find that remittances allow to decrease the rural households'inequality level in Mexico. Azizi (2019) confirms these results for 103 developing countries by specifying that a 10% increase in remittances implies a 1.8% decrease in poverty gap.

savings.

Economic migration distinguishes permanent migration from temporary migration. In this last category, different profiles can be highlighted [7].

Contract migration refers to work permits that can be issued by countries such as the USA, Canada or Australia. In these situations, the migrant is allowed to work in the country for a fixed period. Transit migration defines the case where an individual migrates to several countries until reaching a final destination where he/she can potentially settle there. It differs from circular migration where the migrant travels between the host country and his/her country of origin for economic purposes. The migrant settles temporarily in the host country during periods when the opportunities in the labor market are the most interesting. The return of migration is the situation where the individual makes this decision himself; the migrant may have placed this migration (and return) action in its life cycle.

From equation 1.2, we have shown that a discount rate was necessary in order to estimate the expected wage associated with the migration. The prospective migrant anticipates the future income through the information he/she has concerning the country in which the individual wishes to settle (Dustmann and Kirchkamp, 2002). If the individual makes anticipation errors regarding the labor market, the ability to integrate the host country can be questioned by the fact that the initial income is not achieved. In this situation, the migration project is modified (Bijwaard et al., 2014). As a result, if the individual planned a permanent migration, the migrant can choose to return into his/her home country. If the individual planned a temporary migration, the migrant can choose to return to the country of origin prematurely.

Mistakes that migrants can make are also linked to the recognition of diplomas between countries, as well as the value of professional experiences in the country of origin. Indeed, these two elements may not be recognized in the country of origin, the available positions may in this case not be in line with the profile of migrants. Borjas (1989) pointed out that these expectations errors resulted in a lower income than initially expected. Using US data [8], Borjas (1989) shows that immigrants having difficulties to enter the labor market make up the largest share of individuals returning to their country of origin. These non-recognition of diplomas and professional experiences can be the cause of a premature return of migration as well as errors of anticipation.

Beyond the degree, language learning can also be a factor influencing the integration of immi-

7. We do not take into account the forced migrations in these categories.

8. The data used comes from the Survey of Natural and Scientists and Engineers (1972-1978)

grants in the host country. The literature has put forward two groups of factors influencing language learning. The first factor concerns the distance between the language of the immigrants' country and the language of the host country (Isphording and Otten, 2011). The greater the distance from the language [9], the more difficult it is for immigrants to learn the language of the host country. These difficulties have repercussions on the integration of the labor market. The second factor relates to the individual characteristics and more particularly to the age of arrival of immigrants. The results show that the more young immigrants arrive in the host country, the more they are able to learn a new language. This learning ability facilitates integration into the labor market (Chiswick and Miller, 1990; Dustmann and Fabbri, 2003; Zorlu and Hartog, 2018).

Chiswick and Miller (1996) had characterized three groups of factors influencing the integration of immigrants. Indirectly, these factors have an influence in particular on the success of migration and more particularly on the quality of anticipation of immigrants relative to their economic performance.

The first factor can be associated with the motivation of migration and concerns the economic incentives. The economic incentives are directly related to the anticipation of income in the host country. Immigrants compare the income obtained in the country of origin with the probable income of the host country. If there is an economic advantage to immigrate (by integrating psychological costs as well as migration costs), the individual will take the decision to migrate.

The second factor is related to exposure. This factor is related both to the choice of the host country and to the immigrant's social relations in the host country. The central point of this factor is the frequency of contact between immigrants on the one hand and their peers or natives on the other hand [10].

The last factor concerns efficiency. This factor can be interpreted as the ability of individuals and especially immigrants to be able to convert the exposure into language learning of the host country. The efficiency of immigrants is directly related to individual characteristics. Age helps explain the ability of younger people to integrate more easily in host countries, in particular through a higher language learning ability. This adaptability decreases when the age increases (Long, 1990; Chiswick and Miller, 1996)

In a standard theoretical framework, the investment in human capital of individuals is based on the comparison between the cost of the investment and the expected future income that is

9. The distance of the language is measured from an algorithm based on differences in pronunciation and vocabulary between the mother tongue and the language of the host country.

10. We deal with the influence of the social relations in the next section.

conditional on this investment. However, investment in education for immigrants can be penalized by the non-transferability of diplomas in the host country. The non-recognition of immigrants' past professional and educational skills, acquired in the country of origin, may lead immigrants to have difficulties integrating into the labor market, particularly in terms of the quality of the job held.

Occupational mismatch has been the subject of an important literature on labor economics. The cases of overeducation are characterized by the fact that individuals occupy a job for which they have an educational level higher than the educational level required for the job. Several causes, explaining this occupational mismatch, have been presented in the literature particularly concerning the immigrant population. Støren and Wiers-Jenssen (2010) and Aleksynska and Tritah (2013) have highlighted the fact that the diplomas of immigrants obtained in the country of origin may not be recognized in the host country. Other factors also influence the recognition of immigrants' degree in the host country and more generally influence the probability of immigrants being in an occupational mismatch situation. This occupational mismatch may be the cause of a wrong anticipation of expected income in the host society given the human capital of immigrants.

In addition, financial elements must be taken into account in the "failures" of migration. The cost of living in the host country may be higher than the cost of living anticipated by migrants before they left, due in particular to a lack of information.

From the selection model of Roy (1951), Borjas (1994) formalize the return migration. From migration flows as well as from the return on human capital, the authors base their model on the relative distribution of income both in the host country and in the country of origin. They show that if the host country tends to attract low-skilled workers, the most skilled workers will return to the country of origin and vice versa. This model of migrant selection is an extension of the work of Sjaastad (1962) and Borjas (1987). These selection effects are accentuated if there is a variation in migration costs, for example.

Borjas (1994) check the validity of their theoretical contribution with US data from 1980. They study the selection of migrants according to the distance separating the country of origin from the US but also the political elements of the country of origin like the type of regime in place, the revolutions that the country has known, GDP per capita and finally the inequalities between individuals. Their results show that individuals tend to return to their country of origin when it has a high GDP per capita; when GDP per capita is low, the rate of return to the country of origin is low. Distance, involving migration costs, is also a barrier to return to the country of origin. To test the relevance of their model, the authors also studied the link between the level of

migrants' incomes in the US and the emigration rate. Their results show that an increase in the emigration rate, in the context of a positive selection of immigrants, increases the average income of migrants. Conversly, if there is a negative selection of immigrants, it reduces the average income of immigrants.

Since this contribution, the analysis of Mexican migration has been the subject of a growing literature. Ambrosini and Peri (2012) find that return migrants are a little more positively selected than negatively selected [11] Orrenius and Zavodny (2005) find also a positive selection of Mexican return migrants [12]. However, both of these analyses are based either on a small sample (Ambrosini and Peri (2012), 56 observations) or a dataset composed of migrants from rural areas with high migration rates. These data are therefore not representative at the national level.

The literature presented so far has not incorporated the vision of the NELM. Indeed, we have considered the analyzes where the individual is placed at the center of the models. The aim of the neoclassical approach is to understand how the process of decision relating to the duration of migration takes place. As mentioned above, this decision depends both on the individual characteristics, the country of origin and the host country, as well as the expectations of the economic performances of the immigrants. However, even if there are similarities in the identification of the factors influencing the duration of migration, the NELM presents the permanent and temporary migrations under another prism.

Galor and Stark (1991), in presenting the fundamentals of the NELM, considered this temporary migration strategy as intended and prepared by the individuals because of the possible savings generated by this strategy. Migration is considered here as an insurance solution allowing the household remaining in the country of origin to benefit from savings of the migrated individual. This contribution is highlighted when there is a difficulty in accessing the credit market, for example, or when the household, located in a rural area, has revenues depending on weather conditions.

Moreover, Galor and Stark (1991) show that temporary immigrants have higher incomes in the labor market than natives. They explain this pattern by the efforts of immigrants when they intend to return to their country of origin. Galor and Stark (1991) find, in the case of a temporary migration, that the efforts to find a job made by the migrants are higher. Indeed, the authors make the assumption that the living conditions are identical between the country of origin and the host country. The distinction between the two countries is characterized by the level of income. As a

11. To conduct the analysis, Ambrosini and Peri (2012) use the Mexican Family Life Survey (2002 and 2005 rounds).

12. Their analysis is based on data from the Mexican Migration Project.

result, the arbitration between the duration of migration and the maximization of the wage for immigrants is a determinant of the duration of migration. This argument challenged the work of Hill (1987), who argued that attachment to the country was an exogenous factor. The time spent in the host country allows individuals to increase their savings, which they can spend when they return to the country of origin. The situation on the labor market in the country of origin is also an argument concerning the duration of migration (Dustmann, 1997). The duration of migration becomes a variable of adjustment according to the job opportunities available in the country of origin.

Migration can also be a factor for the return on human capital (Dustmann, 1995). The acquired experiences - educational or professional - can be valued in the country of origin. This effect was found in Ireland (Barrett, 2001), where Irish migrants returning to the country after an international experience had a 10% higher income than those who did not migrate. A study on Egyptian data confirms these results (Wahba, 2007). Return migrants' incomes are about 40% higher than individuals who remained in the country. It should be noted that for this last study, the selection biases were checked (from the estimation procedure of Tunali, 1986 [13]).

From a theoretical point of view, the optimal duration of migration has been formalized by Dustmann et al. (2011). The authors highlight the relationship between human capital investment in the host country and migration decisions. Based on the skills migrants can acquire in the host country, the latter make the decision to return to their country of origin as soon as they consider that these skills are transferable to the country of origin. This investment in human capital is therefore conditioned by the specificity of skills acquired. In particular, the language barrier may be an element limiting this transferability. The transfer of skills is also to be considered when the migrant puts forward his professional experience and his diplomas in the host country. This partial recognition of skills contributes to explain the difference in wages observed between natives and migrants with identical characteristics (Basilio et al., 2014).

Finally, psychological factors take part in the duration of migration [14]. Conversely, attachment to the host country is also decisive in the duration of migration (Constant and Zimmermann, 2003). The integration of migrants in host countries thus becomes fundamental in the duration of

13. Identified biases concern the selection of migrants which is not random. Some individuals characteristics of migrants (educational level) are overrepresented compared to those who have not migrated. The second bias concerns the selection of returnees compared to those who remained in the country of origin.

14. The psychological factors can be related to distance and separation between the immigrant's family and the immigrant.

migration of individuals.

Migration engages the individual (and/or his or her family) in a process that is either temporary or permanent. As a result, integration into the host society is a key issue in understanding the entire migration process. The links kept or not with the country of origin, the feeling of well-being in the host country, the social interactions influence the behavior of the individual.

3. Integration of immigrants into the host country

The analysis of the economic performance of the immigrant population in host countries in the economic literature is directly related to the concept of integration. However, this concept of integration is first different across countries and second the analysis of integration is also linked to the way in which researchers define this concept in their analyses.

In this section, we first discuss the definition of integration from public policies carried out in the countries and in relation to the economic literature. In a second step, we analyze the role of social relations in the process of integration of immigrants into the labor market. For this, we highlight the role of the social environment and more particularly the role of the neighborhood on the integration of immigrants into the labor market and more generally on the implications of social interactions on the behavior of individuals. Finally, we rely on concepts related to homophily and social networks to analyze their contributions to the integration process of immigrants.

3.1 Definitions of integration

3.1.1 Alternative integration policies of immigrants into the host country

The aim of integrating immigrants into host societies is different across countries. Bertossi (2011) present country policies as national models of integration. Bertossi (2011) defines a national model of integration as "a public philosophy (Schain, 2009), a policy paradigm (Favell, 1998; Guiraudon, 2006), an institutional and discursive opportunity structure (Statham et al., 2005) or a national cultural (Brubaker, 1992)" (Bertossi (2011), p 1562). From this definition, Bertossi (2011) presents France as an assimilationist country unlike countries such as Great Britain or the Netherlands. These countries are defined as multiculturalist.

Indeed, concerning the French model, the focus is on the abstraction of the origins of individuals. Based on the ideology developed during the French Revolution, ethno-racial differences between individuals are not taken into account in the society. More precisely, the justifications for such an

approach are based on a principle of equality between all individuals. The approach by equality is placed at the antithesis of any form of discrimination despite this lack of consideration of specificities related in particular to the origin of individuals. The objective of this approach is based on a universalistic approach. Ethnicity of individuals is not taken into account in the French society.

Although France has experienced many waves of immigration during the 20th century [15], questions relating to the integration of immigrants have been at the heart of the political debate only from the 80s. Indeed, before this decade, the action of migration was, in France, considered as temporary. However, previous generations have settled permanently in France. The issue of integrating newcomers and second generations has therefore been taken into account in the societal debate. One of the particularities of taking into account this questioning in France lies on the fact that during the post-war period, in spite of experiencing many immigration waves, policy makers in France did not question the integration of these populations into society.

Regarding Great Britain and more particularly British citizens, the place of maintaining cultural traits is at the heart of the integration policy. In contrast to the French model, individuals are not considered as abstract subjects. The British model places the individual as a whole at the heart of society by recognizing all minorities. As previously stated, Bertossi (2011) presents Great Britain as having a multiculturalist approach. Whatever the origin of individuals, cultural specificities are taken into account in British society. This allows individuals to have equal access to rights while recognizing minorities and their characteristics (See Manning and Georgiadis (2012) [16]).

The objective of this section is to characterize the differences in terms of policies according to the countries as to the will to introduce or not the cultural specificities of the individuals according to their origin. This willingness of integration is not to be regarded as being positive or negative but are more to be considered according to the epistemological approach. Indeed, France is more in a normative vision by ignoring the cultural traits of individuals in contrast to so-called multiculturalists countries. Multiculturalist countries position themselves in a positive approach with the desire to integrate immigrants by taking into account their cultural specificities.

3.1.2 Definition and measure of the integration of immigrants in the literature

In the economic literature and more generally in the human sciences, the integration of immigrants into the host society has been built in parallel with socio-political questions. This questioning

15. The different waves of immigration came mainly from Spain, Italy, Portugal and Maghreb.

16. one example is the authorization to keep the turban for the Sikh community, whatever the profession of individuals.

became part of the literature following the increase in migratory population flows since the post-war period. In addition to the increase of these flows, particularly in the French case, migration is no longer considered to be an action limited in time and characterized by a return to the country of origin of individuals. Immigrants, initially considered temporary, settle permanently in the host countries. The integration of immigrants into host countries becomes a major societal issue for which governments try to adapt their integration model to the specificities of groups of individuals present in the country. These questions have also been the subject of an important literature in human sciences.

The article of Berry (1997) is one of the first to present, theoretically, the relationship between the cultural context and the behavioral development of individuals [17]. The goal of his approach is to characterize acculturation, i.e. the potential psychological effort for individuals trying to rebuild their lives in a country where culture is different from their original culture. Beyond the contributions related to the implications of acculturation, the work of Berry (1997) also makes it possible to highlight the importance of psychology in economics. Indeed, even if we can draw parallels with the following works in economics, Berry (1997) 's acculturation model presents the foundations of a literature on the process of integration of immigrants into the host society.

The model of Constant and Zimmermann (Constant and Zimmermann, 2008) follows this work in psychology. Constant and Zimmermann find their source partly in the societal questions raised during the 80s. The idea of their approach lies in the ability to define and characterize the identity of immigrants between the host society and their society of origin. In their work, Constant and Zimmermann (2008) define ethnic identity as "*a property that a person has for a period, [the individual] may lose it and acquire a new one, or lose it and not recover*" (Constant and Zimmermann (2008), p 425). The purpose of their article is to show to what extent ethnic identity is decisive in the performance of migrants on the labor market. Using German data, Constant and Zimmermann (2008) built an indicator called ethnosizer to measure the identity of individuals. The objective of this indicator is to understand how migrants integrate into the host country and adopt, in particular, the language and customs of the host country while keeping or not those of their country of origin. Starting from the ethnosizer, four stages make it possible to characterize each individual's behavior: assimilation, integration, separation and marginalization.

17. Berry proposes a conceptual framework based on a psycho-sociological approach. The identity of the individual is positioned according to an intercultural choice based on the cultural identity of the home country and the cultural identity of the host country.

The authors talk about integration when the migrant becomes accustomed to the culture of the host country and the cultural identity linked to the country of origin remains strong. Assimilation corresponds to the case where the individual is detached from the culture of the country of origin but that the attachment to the culture of the host country is strong. Separation is the opposite case, the migrant has difficulties of integration in the host country and the attachment to the country of origin remains strong. Finally, marginalization corresponds to the case where the migrant does not recognize himself in any of the societies, nor that of the country of origin, nor that of the host country. According to these dimensions, it is understandable that individuals vary their migration duration according to their integration capacity. The migration time of individuals is therefore determined by all of these characteristics mentioned above. Variables such as age of arrival, origin, sex and level of education influence the individual's ability to integrate [18].

The concepts developed by Berry (1997) and Constant and Zimmermann (2008) place at the heart of their model the relationship between two dimensions: the individual on the one hand and the norms of the countries (country of origin and host country) on the other hand. This relationship, consisting of a variable characterizing the identification of the individual in the host country or the country of origin, is constructed from binary variables for the model of Berry (1997), unlike the ethnosizer of Constant and Zimmermann where the variable relating to the identification of the individual in the habits and customs of the country is continuous.

From the model presented by Constant and Zimmermann (2008), Bisin et al. (2016) present two behaviors adopted by immigrants concerning the identity conformity of individuals with respect to the host society. Their study highlights the complementary or substitutable link between the formation of identity and residential segregation. When the cultural conformity is the main source of identity formation, residential segregation and identity formation are complementary for ethnic assimilation. If the main source of identity formation is the cultural distinction, residential segregation and identity formation are substitutes for ethnic assimilation.

Beyond the relative contribution of the complementary or substitutable relation between identity formation and residential segregation, Bisin et al. (2016) show that the composition of the environment is decisive according to the position of individuals with respect to the culture of the host country. Despite the fact that these elements are not fundamental in the definition of inte-

18. Some papers focus on the causal effect of language skills on fertility, health or employment (Aoki and Santiago, 2015; Guven and Islam, 2015; Flores et al., 2005; Yao and van Ours, 2015). In general, without taking into account the role of peers and the urban environment, the younger immigrants arrive in the host country, the higher the language skills. This better language performance allows immigrants to integrate more easily into the host society.

gration, they nevertheless make it possible to characterize integration as well as to highlight the elements that can influence the integration process of immigrants.

From these references, we can highlight the fact that the cultural identity of individuals in general has been at the heart of the definition of integration in the host society by researchers in the human sciences. The common point between these different approaches is that integration is built according to the position of immigrants with respect to the norms and customs of the country of origin and the host country. The introduction of elements relating to the environment of individuals was introduced later to characterize the process of integration of immigrants in the host country.

However, as noted by Bisin et al. (2016), the identity construction of individuals is not limited to the willingness of individuals to integrate or not into the host society. This identity construction is also characterized by the social relations that individuals have with their family environment, neighborhood or friendship. The endowments specific to the residential area of individuals become thus necessary elements in the analysis of this integration process.

3.2 The role of the environment in the integration process of immigrants

Immigration is not characterized by a simple action limited by the move between the country of origin and the place of destination of individuals. The migration action is part of a broader temporal framework in which the integration process in the host country must be taken into account in order to characterize the quality of migration.

We consider that the integration of immigrants in the host country is characterized by the economic performance of immigrants. The economic performance is defined according to the professional situation of the individuals (in employment or unemployment), the observable differences between natives and immigrants in particular in terms of wages or according to the job quality (occupational mismatch situations).

3.2.1 Individual determinants and integration into the host country

The literature on the economic performances of immigrants is characterized by five approaches.

The neoclassical approach suggests that all workers are paid according to the human capital (Borjas, 1994; Massey et al., 1994). This approach assumes that if there are differences between natives and immigrants in the labor market, this suggests that immigrants have a lower level of human capital than natives. This difference in human capital can be explained in particular by

the non-transferability in the country of destination of the educational and professional experiences acquired in the country of origin.

Integration difficulties in the host country are also correlated with the age of arrival. The younger immigrants arrive in the host country, the higher the economic performance (Dustmann, 1996). This result is explained by a better adaptability of young people to their environment. This adaptation is characterized by a better learning of the language of the host country as well as the norms of society.

A second approach suggests that minority groups face discrimination in the labor market. Discrimination can come from firms or individuals belonging to the majority group. The difficulties of integration of immigrants in the country of destination are explained by the occupational choice of immigrants in jobs for which the wage is low or the creation of their own jobs (Portes and Zhou, 1996). Empirically, self-employment rates are higher for immigrants than for natives in the USA (Borjas, 1986; Lofstrom, 2004) as well as in European countries (Andersson and Wadensjo, 2004).

However, even if differences in human capital (via the non-transferability of educational and professional experiences) and discrimination of minority groups help to explain the difficulties of integration of immigrants in the destination country, the duration of migration, via an assimilationist approach, could enable immigrants to overcome these integration difficulties by adapting and adopting the norms of the host country. Integration difficulties are explained in the literature by different factors. The first concerns periods of economic recession. Due to the potential segmentation of the labor market between natives and immigrants, immigrants tend to be more vulnerable in the labor market during these periods (Hoynes et al., 2012; Kingston et al., 2015). The causes of this economic performance during recessions are due in part to increased competition in the labor market. Immigrants are perceived as direct competitors by natives in the host country (Esses et al., 2001; Kunovich and Deitelbaum, 2004).

Taking into account the background of immigrants and its consequences on the integration process is necessary for both immigrants and their descendants. Depending on the level of education, the duration of migration, the country of origin, the host country and the economic context, the integration process does not follow a linear model characterized by a progressive integration of immigrants into society (Van Tubergen, 2006; Ward et al., 2010). In line with the progressive integration approach for immigrants, the Life Course integration model consists in considering migration and the integration process in a global context. The idea is to combine both a microeconomic approach by considering the individual (associated with individual characteristics) but

also a macroeconomic approach by integrating the societal context of the country of origin and the host country (Wingens et al., 2011). This approach suggests that a dynamic analysis should be introduced in order to study the process of immigrant integration, including the introduction of intergenerational analyzes (Laganà et al., 2013).

The difficulties of integration of immigrants can also be characterized over several generations. The concept of ethnic mobility trap (Wiley, 1967) applies to the analysis of immigrants and their descendants. The idea of this concept is that an ethnic group can be a determining factor in the integration of immigrants into the host society and this effect can also impact the integration of second generation. This theoretical concept is confirmed empirically, especially when the size of the ethnic group increases sufficiently until a significant threshold is reached in the total population (Wilson and Portes, 1980). In this situation, the role of the ethnic group may be to overcome the difficulties of integration into the labor market caused by individual characteristics (non-transferability of diplomas, language skills of the host country). The size of the ethnic group or the perception of the size of the ethnic group in society is also crucial in the integration process. The idea is that if the ethnic group reaches or seems to reach a significant threshold in the population, the natives perceive immigrants as competitors in the labor market. Situations of discrimination of the ethnic group may hinder both contact between natives and immigrants in society, but also develop self-employment by immigrants (Fossett and Kiecolt, 1989; Gobillon et al., 2014).

3.2.2 Location choice

The literature has focused on the relationship between immigration and location choice. The urban organization of cities, more specifically American cities, has been studied through the work of Kain (1968). He shows that Black-Americans tend to concentrate in the city center. The spatial concentration of Black Americans is accompanied by an unequal distribution of jobs within the city. In fact, jobs in the analysis of Kain (1968) are mostly located in the suburbs, i.e. in a place different from the place of residence of the Black-Americans. This spatial concentration of individuals sharing the same characteristic leads to a situation of imbalance both in the labor market, because the Black Americans are far from work places, but also in the distribution of individuals according to their characteristics within cities.

With a similar approach, Stark (1991) showed that immigrants tend to concentrate spatially in host countries. Despite a geographic distribution of population and country-specific urban policies, empirical results are robust across diverse destination countries (Borjas (1999) and Chiswick and

Miller (2004) for the USA, Edin et al. (2003) for Sweden). The interest in concentrating spatially lies in the advantages of sharing traditions, norms and mother tongue between people of the same origin (Bauer, 2002; Barry R and Miller, 2005). As a result, established immigrants and newcomers can pass on to each information on the labor market of the host society, making it easier to find a job.

Two models propose an approach to explain the behaviors and incentives of individuals to focus spatially within the host country: spatial assimilation and place stratification.

The first model, the spatial assimilation, highlights the fact that immigrants tend to settle in ethnic enclaves when arriving in the host country in order to benefit from information about the host country's norms and customs (Logan et al., 2002). This information relates to the labor market and the real estate market. In addition, residing in an ethnic enclave also allows newcomers to benefit from assistance in the host society from a linguistic point of view. In particular, sharing a common language with peers allows newcomers to acquire the codes relating to the country's norms and to understanding the job market.

The choice of location of newcomers is also determined by access to housing. The main idea of this model is that integration in the host country's space is characterized by a gradual integration into the urban space of newcomers by locating themselves in the first place where the peers are. Then, immigrants gradually settle into neighborhoods where the proportion of peers is lower (Massey, 1985; Rosenbaum et al., 2007). This opening of social relations allows individuals to benefit from a broader social network. These works shows that language skills and the age of migration allow immigrants to reduce urban segregation. This is notably characterized by a better integration of immigrants into the labor market.

The second model characterizing urban segregation is the place stratification. This one is defined as a hierarchy of the districts with the aim to maintain a social distance between different social classes. The particularity of this model lies in the fact that the explanatory factors of segregation are characterized by the creation of barriers to entry to certain neighbourhoods in order to maintain a social and physical distance between the leading group and certain minorities (Massey et al., 1993; Logan et al., 2002). The integration process, in this approach comes more in continuation of the work of Kain (1968) where the segmentation of the urban space is placed at the heart of the analysis. The distribution of jobs within cities reinforces this segregation.

The organization of the urban space associated with the location choice of immigrants directly influences the integration process of immigrants. Although the process of integration of immi-

grants in the host country is partly determined by the location choice, social interactions with peers, neighbours and natives also influence the integration process. In this extension, we are interested in the role of social networks in the integration process both with the composition of the neighbourhood, i.e. according to the location choice of individuals, but also in relation to the interactions of immigrants with their peers.

3.2.3 Influence of the social relations on the integration into the host country

The introduction of peers into the integration process of immigrants has resulted in the cultural conformism of immigrants associated with social relations between individuals. Akerlof and Kranton (2000) introduced identity and psychological factors into the utility function of individuals in order to integrate social norms into economic analysis. The spatial concentration of immigrants, the social pressure that can be inherent to the community can induce respect for the social norms of the specific community at the origin of the individuals. However, it should be noted that the term social norm is not used by Akerlof and Kranton (2000). They prefer the term prescription to social norm in order to introduce an emotional dimension into this semantic choice. In their article, the term prescription translates into the introduction of psychological costs in the utility function of individuals. These psychological costs depend on the effort made by individuals to conform or not to the social group to which they belong.

In this continuity, concepts such as Acting White have emerged to illustrate the fact that "*Individuals exposed to these social interactions have disincentives to invest in particular behaviors (i.e., education, ballet, proper speech) due to the fact that they may be rejected by their social peer group*"(Austen-Smith and Fryer, 2005). This is characterized by an attitude of opposition from some immigrants with regard to their cultural background. This notion of Acting White influences the process of integration of immigrants in the host society, either at the educational level or concerning jobs.

Social relations of individuals are not only influenced by location choices. The concept of homophily characterizes individuals' preferences to interact with others with similar characteristics (Calvo-Armengol and Jackson, 2004b). This preference is particularly apparent in the labor market, where individuals will be more likely to pass on job opportunities to people with similar characteristics. In particular, an index to measure the preferences of individuals to interact with people with similar characteristics is proposed by Currarini et al. (2009). The index takes the following

form:

$$H_i = \frac{s_i}{s_i + d_i} \tag{1.6}$$

With s_i corresponding to the number of links between the individual i and individuals with similar characteristics. d_i corresponding to the number of links between the individual i and people with no similar characteristics with the individual i. This index makes it possible to calculate the proportion of individuals according to their characteristics among the social relations of an individual. At the same time, the share of individuals present in a geographical area g, with a similar characteristic to the individual i denoted s is also calculated, we note this share $N_{g,s}$. If $H_i > N_{g,s}$, then the individual i has a preference to interact with people with similar characteristics. Homophily is characterized in this situation. Conversely, if $H_i < N_{g,s}$, then the individual is heterophile and has a preference for interacting with individuals with different characteristics.

The preference of individuals to interact with individuals with similar characteristics influences the transmission of job opportunities and therefore the occupational choice. Applied to the immigrant population, homophily is characterized by peer effects. Peer effects enable immigrants to compensate for the difficulties of integration into the labor market. Munshi (2003) puts forward the idea that the use of social networks is linked to a failure of the traditional method of job search. He states that the government authorities are not effective in finding employment for the population [19]. Network effects are characterized by the influence of social networks on the probability of finding a job for immigrants. His results show that for two individuals from the same country [20], the immigrant who used the networks has a higher probability of being employed. In addition, Munshi (2003) specifies that the individuals who are the most often discriminated in the labor market (the elderly, women, the least educated individuals) are the individuals benefiting the most from the information conveyed by networks. McKenzie and Rapoport (2010a) show that migrants with a lower educational level tend to rely on the social network to integrate the labor market contrary to immigrants with a higher educational level.

The peer effects is confirmed by Patel and Vella (2013a) and Schuetze and Wood (2013). Beyond the role of the referral to find a job, referrals of the same origin also influence the occupational choice of immigrants. This is characterized in particular by the proportion of immigrants in certain jobs.

19. The use of the immigrated population is motivated by the contributions of Rees (1966) and Granovetter (1973) concerning the similiarities existing between job seekers and referrals.

20. Munshi uses US data with Mexican population to analyze the network effects.

If the share of immigrants increases in a job, the probability of being in this occupational choice for immigrants significantly increases. The theoretical model developed by Tassier and Menczer (2008) characterizes relationships between individuals and the proportion of peers within a firm. By integrating the origin of immigrants, the authors identify the effectiveness of networks in the transmission of job opportunities. Their results show that the transmission of job opportunities is determined by the organization of networks. For this, the networks of minority groups must be organized into subgroups composed of a few individuals while having a connection between each of these subgroups. In comparison with the majority group, the authors show that a network organization based on the multiplication of subgroups can significantly reduce the unemployment rate of minority groups. The explanation of these results resides in the multiplication of the strong ties composing the network of the minority groups whereas the majority group is more composed of weak ties [21]. These results confirm evidence on the role of immigrant concentration in certain jobs on the probability of finding a job in a particular occupation for an immigrant (Dustmann et al., 2011).

Social interactions with individuals living in the same residential environment influence the economic and educational performance of workers (Topa, 2001; Bayer and Ross, 2006). As a result, the links between individuals living in the same neighborhood are not limited to contacts with peers, but to all individuals regardless of their origin and socio-professional categories. In this context, from the Moving to Opportunity policy (MTO) [22], researchers analyzed the externalities created by work activity and education levels on newcomers to the neighbourhoods. The results are not homogeneous according to the type of population studied. Indeed, Gennetian et al. (2012) find that households that have moved to a neighbourhood with a low poverty rate do not have significantly better labor market outcomes.

However, individual characteristics of newcomers such as age and education play a significant

21. According to Granovetter (1973), there are two types of relationships between individuals: strong and weak ties. An individual's social network characterized by distant and extensive relationships constitutes the weak ties. Conversely, strong ties are characterized by a proximity social network linking few individuals. Granovetter's contribution is to show that weak ties benefit individuals more than strong ties by creating effective social connections to convey information between individuals.

22. In the 1990s, the US government conducted an experiment in five cities. Families volunteering to participate in this experiment were divided into 3 groups: the first group received a voucher to move to a neighborhood with a low poverty rate, the second group received a voucher and could choose the new place of residence, the third group was the control group and did not receive any help or assistance. The objective of this experiment was to study the relation between neighborhood and the economic and educational performance of individuals.

role in mobilizing social networks to find employment. The relationship between these individual characteristics and social interactions with the neighborhood has been studied in the MTO program. Chetty et al. (2016) show that individuals under the age of 13 when they arrive in the new neighborhood have better labor market outcomes. The relationship between age and the ability of individuals to adapt to their environment confirms the work of Heckman (2006). Indeed, the work of Heckman (2006) emphasizes the development of children's cognitive skills in relation to their economic and social environment. The relationship between the environment and the development of cognitive skills determines the future learning capacity and productivity of individuals. Chetty et al. (2016) show that children arriving in an environment with a low poverty rate perform better in education and employment in the future compared to other children who remain in a residential environment not benefiting from a low poverty rate. Similarly, age plays a similar role for immigrants when they arrive in the host country. Indeed, the younger individuals arrive in a new place of residence, the more they are able to adapt to adopt the norms of the social environment of the place of residence as well as the language of the host country.

The transmission of jobs also implies an occupational choice induced by the referral. The motivation of individuals to use a referral to find a job is related to information asmmetry. Indeed, from the worker's point of view, unemployed workers do not have access to all the information concerning job vacancies (Calvó-Armengol and Jackson, 2007a; Ioannides and Soetevent, 2006). The mobilization of a referral allows individuals to reduce this asymmetric information directly through the presence of the referral in the firm or indirectly through members of the individual's network. The probability of finding a job using this approach depends on two factors: the size of the network and the proportion of unemployed individuals in the network. As the size of the network increases, the probability of finding a job through the network increases. Conversely, as the proportion of unemployed individuals in the network increases, the probability of finding a job through the network decreases.

The probability of being unemployed depends on the business cycle. In periods of economic recession, the job separation rate plays an important role in the probability of being unemployed (Sutton, 2013). However, this increase in the unemployment rate induced by the job separation rate is not sufficient and is also dependent on individual characteristics (Gomes, 2012). The job separation rate depends, among other things, on the educational skills of individuals. Workers with a low level of education are more affected by an increase in the job separation rate.

Associated with the notion of homophily and the particularity of having similar characteristics

among individuals from the same social group, the job separation rate can have a particular impact on a specific group. Thus, if the unemployment rate increases within this group, individuals will have more difficulty to find a job through a member of their social network. Conversely, if the origin group is not very affected by the job separation rate, relying on peers to find a job can make it easier for individuals to find a job in times of economic recession.

From the point of view of labor demand, the use of a referral to find a job makes it possible to reduce recruitment costs as well as to reduce the information asymmetry relating to the quality of the future worker (Montgomery, 1991; Munshi, 2003). Unlike a formal hiring method, using an employee to recruit a new worker provides information on the quality of the individual. Indeed, formal recruitment methods are limited to disseminating the quality of a candidate only on the basis of the individual's degrees.

Although referrals make it easier for immigrants to integrate into the labor market, this improvement in the position of immigrants on the labor market does not guarantee access to a job for which immigrants are qualified. However, the acquisition of human capital does not guarantee a job for which individuals will have the required educational level. This job quality is characterized by the occupational mismatch. The occupational mismatch can arise in situations where the individual does not have the level of education required for a job (vertical mismatch) or in situations where there is a difference between the educational skills of the individual and those required for the job (horizontal mismatch). Applied to the immigrant population, individual factors may help to explain situations where individuals are overeducated [23].

Social factors may also impact the likelihood of immigrants being in an occupational mismatch situation. The mobilization of referrals can be justified either by a desire to reduce the information asymmetry on the quality of the future job held, or by the necessity and ease of finding a job through a peer or a member of the social network. The literature has heterogeneous results concerning the relationship between the role of referrals in finding a job and the probability of being in an occupational mismatch situation. Kalfa and Piracha (2018) show that the use of referrals to find a job has a positive role only for immigrants with a high level of education while the use of referrals is negative when they consider all immigrants. The migratory history and more particularly the integration of the group of origin in the host society also influences the probability of being in an

23. Immigrants may have difficulties in transferring human capital acquired in their countries of origin. These transfer difficulties are due to the non-recognition of diplomas or professional experience acquired in the country of origin. In addition, if individuals do not speak the language of the host country, this may increase difficulties in integrating into the labor market (Chiswick and Miller, 2009a; Chiswick and Miller, 2010).

occupational mismatch situation. (Battu et al., 2011). They found that if an origin group has successfully integrated into the labor market, it reduces the likelihood of being in an occupational mismatch situation for newcomers.

As part of the process of integration of immigrants in the host country, the use of a referral to find a job is characterised both by the degree of homophily of the individuals and the composition of the residential environment. The consequences of referrals on the integration of immigrants on the labor market concern both the choice of occupation and the occupational mismatch. However, as we saw in the first section, the quality of the labor market position has a direct effect on the integration process.

4. Conclusion

The economic theories on migration have evolved and adapted to the observed behaviors with an analysis centered on the migration decision in a first time and an analysis related to space and temporality in a second time. Each period of history has been the subject of specific migrations: post-war migration, from the Mediterranean countries to Northern and West Europe, migration from Latin America to the United States, the development of work permits with selective migration policies for some countries. Migration-related theories have been proposed with the introduction of human capital in the migration choice, the introduction of family strategies by the New Economy of Labor Migration, or the consideration of temporalities of migration.

Migration, as displacement, is only the beginning of the integration process. Integration is indeed the key factor in contributing to a successful migration. The analysis of migration is not limited to a simple decision and a move between two regions. The choice of location, the economic environment and the social relations are also crucial in understanding the integration of migrants in the host country. The sharing of information within the network is both created by the aggregation of all individuals from the same origin but also by the sharing of traditions, languages, customs of between immigrants. The effects of these networks can be twofold: they can allow newcomers to find a job more easily but at the same time, the network can have a segregating effect by not allowing the individual to integrate optimally in the host society.

Beyond the influence of economic and social factors on the transmission of job opportunities, all of these factors also influence the quality of jobs for immigrants. The integration of human capital through the occupational mismatch allows both to characterize the existing gaps between natives

and immigrants on the probability of being in an occupational mismatch situation, but also characterizes the heterogeneity of the results between each of groups of immigrants. Indeed, the common results to all these studies, at the level of migration choices, of the integration process but also at the level of the determinants and the role of social and economic factors, show the heterogeneity between the groups of origin . This particularly characterizes the difficulties researchers have in constructing a model that respects the life-course approach in which all the microeconomic and structural characteristics are integrated. In this perspective, the contribution of recent works on the integration of social and environmental factors associated with the heterogeneity of immigrants opens the debate on the dynamics of the assimilation of immigrants and their descendants.

Chapter 2

Network matching efficiency along the economic cycle: Evidence from immigrants in France

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This chapter is associated to an original paper written with Eva MORENO-GABLBIS and François-Charles WOLFF.

1. Introduction

Debates on the integration of immigrants in host countries, particularly in Europe, are supported by historically large and growing flows of immigrants and refugees to Europe. The long-term economic consequences of these population flows are linked in particular to the integration of immigrants into the labor market. This integration into the labor market is characterised by access to jobs depending both on the individual characteristics of immigrants, but also on the influence of the economic and social environment.

Even if social networks influence the economic performance of immigrants (wages, employability, job quality), economic conditions upon arrival in the host country and more particularly the economic cycle also impact on the labor market performance of immigrants (Bratsberg et al., 2010; Bratsberg et al., 2014).

The objective of this paper is to analyze the role of the network matching rate along the economic cycle, where the network matching rate is defined as the probability of finding job thanks to social relations. We focus on immigrants since peer effects have been shown to be of major importance for this population subgroup. Using French data, we propose two alternative indicators of the network matching rate. The first one corresponds to the traditional definition used in previous works (see for example Galeotti and Merlino, 2014) and is based on direct recommendation from a friend, relative or colleague. The second indicator internalizes the fact that the employability of an individual from a given origin in a given job may be influenced by the presence of peers in this job. According to our results, the behavior of both indicators does not essentially differ along the economic cycle and is in line with the prediction of our theoretical framework. Assessing how the matching efficiency of job contact networks varies along the cycle has important implications in terms of both unemployment probability and wages.

The empirical economic literature reveals that around 50% of individuals obtain or hear about jobs through friends and family in developed countries (for studies on US data see Holzer, 1987; Holzer, 1988, Montgomery, 1991, Granovetter, 1995 or Brown et al., 2016; on Portuguese data see Addison and Portugal, 2002; on Swedish data see Kramarz and Skans, 2014). [1] Referrals are actually increasingly used by big companies to find new hires, saving time and money. Firms are more likely

1. The evidence that many workers become aware of available jobs through word-of-mouth has led to an increasing number of theoretical studies, which have explored the importance of social networks for various labor market outcomes (see Calvo-Armengol, 2004; Calvo-Armengol and Jackson, 2004a; Calvó-Armengol and Zenou, 2005; Calvó-Armengol and Jackson, 2007a or Galeotti and Merlino, 2014).

to hire applicants referred by current employees than non referred applicants (see Ioannides and Datcher Loury, 2004 or Topa, 2001 for a survey). Using data from one US firm, Brown et al. (2016) estimate that referred candidates are twice as likely to land an interview as other applicants. For those who make it to the interview stage, the referred candidates have a 40 percent higher chance of being hired compared with other applicants. Using field experiments, Pallais and Sands (2016) find that referrals contain positive information about workers' performance and persistence that is not contained in workers' observable characteristics. [2] Moreover, referrals perform particularly well when working directly with their referrers.

This hiring trend presents though some major problems. First, as reported by Ioannides and Datcher Loury (2004), the acquired social contacts develop along dimensions such as race, ethnicity, religious affiliation and education. Brown et al. (2016) find that 63.5 percent of employees recommended candidates of the same sex, while 71.5 percent favored the same race or ethnicity. This is likely to have adverse long run effects in terms of diversity and skill variety within firms. Second, people who are disconnected from the labor market, *i.e.* long-term unemployed, are even less likely to find a job in this context. Third, during expansions, when the labor market is tight, employees are less likely to have friends seeking for jobs. When employment opportunities are abundant, people are less likely to need social contacts to find a suitable job.

We focus on this last issue, *i.e.* time changes along the economic cycle in the probability of finding a job through friends, relatives or formers colleagues. As noted above, we focus on immigrants since peer effects have been shown to be of major relevance for immigrants' location decisions (see McKenzie and Rapoport, 2010b) and for labor market outcomes (see among others Waldinger, 1996, Munshi, 2003 or Patel and Vella, 2013b). Moreover, since the work by Altonji and Card (1991), many papers on migration have instrumented the current distribution of immigrants across geographical locations and jobs using the historical settlement of their peers (see Card, 2001, Card, 2009, Cortes and Tessada, 2011, D'Amuri and Peri, 2014 or Moreno-Galbis and Tritah, 2016). Such an instrument has proven to be a strong determinant of contemporaneous inflows. This is usually justified by the driving role of networks concerning immigrants' geographical and occupational choices. This driving role results though from a long-run trend. In the short-run, there may be variations in the importance of social contacts as drivers of immigrants' occupational choices depending on labor market conditions.

2. Calvo-Armengol and Jackson (2004a) also underlined the role of social networks as sources of information that help the match between vacancies and job seekers.

The role of networks along the economic cycle is studied in Galenianos (2014). Using a search model with social networks the author predicts that while higher use of referrals increases aggregate matching efficiency and the proportion of jobs found through a referral, a higher efficiency of the matching function increases aggregate matching efficiency but reduces referrals. Moreover, unemployment rate reduces the flow of referrals. Arbex et al. (2016) propose a theoretical setup in which the complementarity of networks and direct search by the unemployed amplifies the short run response of the economy to a technological shock. In Cahuc and Fontaine (2009) social networks can be over-utilized or under-utilized, with respect to an efficient allocation. Moreover, the existence of different job search methods can give rise to a higher job search intensity than the efficient one.

These studies assume that the intensity of the information flow in the network is exogenous, an assumption that prevents the analysis of how incentives in networking relate to different labor market conditions. Galeotti and Merlino (2014) propose a theoretical framework in which workers invest in forming referral networks taking into account labor market conditions before matching in the labor market (*i.e.* networks are a set of links that persist once formed). [3] Using UK data, they find that the network matching rate is increasing in the separation rate when the separation rate is low, while it decreases when the separation rate is high, leading then to an inverted U-shape profile. The counter-cyclical movement in referral-based search is rationalized by Schmutte (2016) in a model of frictional job matching in which the intensity at which referrals are used is endogenously determined (with unemployment, vacancies and the wage rate) and exhibits a non-monotonic relation with labor market tightness. Whether referrals are converted to jobs is inversely related to the intensity of use of referrals.

While in our paper we do not endogeneize incentives in networking depending on labor market conditions, we still find a counter-cyclical progression of the network matching rate along the economic cycle, suggesting that endogenous incentives to network tend to reinforce the already existing counter-cyclical pattern between the network matching rate and the economic cycle. [4] In contrast with Calvo-Armengol and Jackson (2004a) and Calvó-Armengol and Zenou (2005), [5] we do

3. Merlino (2014) proposes an extension of Galeotti and Merlino (2014) in which workers can affect the arrival rate of job offers by searching more intensively.

4. We do not deal with network investment issues. Implicitly we assume that along the economic cycle, individuals do not make strategic choices to spend more or less time with network members depending on their employment status. The number of contacts of the individual and the time spent with each of them are assumed exogenous and constant.

5. Calvo-Armengol and Jackson (2004a) establishes a general nonmonotonicity result on information flow and unemployment with respect to network size in symmetric networks. In Calvó-Armengol and Zenou (2005) when the

not consider the network size but the probability of finding a job thanks to a social contact (network matching rate). Inspired from Beaman (2011); Galenianos, 2014; Galeotti and Merlino, 2014; Stupnytska and Zaharieva, 2015 and Schmutte (2016) we propose a simple theoretical framework to study the relationship between the probability of finding a job through social networks and the economic cycle.

Our contribution is empirical and we exploit for that purpose the French Labor Force Surveys 2003-2012. We propose first an indicator of the network matching rate based on the probability to find a job through social interactions (friends, relatives or colleagues). This traditional indicator, also employed in Galeotti and Merlino (2014), corresponds to what we will refer as direct ties, since it implies a direct recommendation from a friend, relative or colleague. [6] We propose a second indicator in which the individual does not benefit from a direct recommendation to find a job, but rather from a positive externality related to the geographical origin. Because of their geographical origin, individuals implicitly belong to a social network that increases their employment probability in a job where there is already a large share of their peers because communication and cultural issues are simplified among individuals from the same geographical origin.

Using these two indicators, we investigate the variation of the network matching rate for immigrants along the economic cycle. When using direct recommendation as a measure of the network matching rate, our estimations reveal that for the observed values of the job finding rate in France, the relation between the probability that the individual finds a job through social interactions and the job finding rate is decreasing. We find similar results when considering an alternative indicator that exploits indirect ties of immigrants related with their geographical origin. Overall our empirical findings are consistent with the prediction of our theoretical framework.

The remainder of our paper is organized as follows. Next section presents a theoretical framework shedding light on the relationship between economic cycle and the network matching rate. Section 3. describes the database, the variables and provides some descriptive statistics. Section 4. explains the econometric approach while the main estimation results are presented in Section 5.. Section 6. presents concluding comments and discusses the limits of our approach.

network size increases the unemployed workers hear about more vacancies through their social network. However, above a certain critical value, job matches decrease with network size.

6. It could also match with the notion of strong ties introduced by Granovetter (1973) which corresponds to the socialization process that takes place inside the family or close friends, while weak ties correspond rather to random encounters outside the family or friends. See also Goel and Lang (2019).

2. Theoretical framework

2.1 Labor Market

We consider a one-period static model inspired from Beaman (2011); Galenianos, 2014; Galeotti and Merlino, 2014; Stupnytska and Zaharieva, 2015 and Schmutte (2016). The economy is composed by S independent networks. The number of members in each network is denoted N_t and all these members are assumed to be employed at the beginning of the period. Following Beaman (2011), we make the simplifying assumption that all individuals within a network are connected. Networks are made up of individuals that only exchange with each other and have no contact outside their own network. Individuals belonging to different networks do not actually communicate together. We consider that a local labor market corresponds to one network and ignore potential interactions or congestion problems associated with the presence of other networks in the economy. [7]

The dynamics of each of the S labor markets is characterized by two parameters. On the one hand, $\delta \in (0,1)$ stands for the job separation rate at the beginning of the period. A random sample of workers loses their job at the beginning of each period with probability δ. The number of individuals loosing their job is given by δN_t. If a worker loses the job, the worker becomes a job seeker. The probability that an individual keeps the job equals $(1-\delta)$, so the number of individuals keeping their job equals $(1-\delta)N_t$.

On the other hand, $a \in (0,1)$ stands for the probability that the individual receives directly a job offer, while $(1-a)$ will stand for the probability of receiving a job offer via the network. If an agent is unemployed and receives information on a job vacancy, the agent accepts the position. If the individual in the network who receives the information on a vacant job is employed and has not lost the job, the individual passes along the information to a randomly selected network member. [8] If this member is employed, the vacant job is lost. If the member has lost the job, the member will occupy the job in the next period. Job seekers receive then information on a job offer directly from a firm or indirectly through a network member. In both cases, the individual keeps this job offer.

Both parameters δ and a are assumed to exogenous. We will analyze how changes in a affect the

7. As underlined by Schmutte (2016), the probability that a worker is hired through a referral is decreasing in the intensity of referral use by other workers. This within-network congestion effects are though not considered in our setup.

8. We assume that all job offers are symmetric, so the employed individual has no interest in quitting the job and accept the current job offer. In our framework, we do not model the quitting behavior and job separations can only arrive through exogenous shocks.

probability of unemployed to find jobs through social contacts. Contrary to Galeotti and Merlino (2014) or Schmutte (2016), in our setup individuals cannot decide to invest more or less effort/time on networking depending on labor market conditions. The predicted relationship between the job finding rate and the network matching rate will then capture the structural relation between both variables. We abstract from potential influences coming from workers' strategic behavior depending on returns to network investment related to labor market conditions. Intuitively, these strategic behaviors are likely to reinforce expected results. When the job finding rate is still low, many people in the network are likely to be unemployed and then investing in network relations is likely to have a low return, since network members will not be able to transmit job offers (as they are unemployed they keep these job offers for themselves). Individuals will have a low incentive to invest in networking. In contrast, as the job finding rate increases, an increasing number of network members becomes employed and thus incentives to invest in networking increase.

2.2 Matching function

The matching function within a particular local labor market is denoted by $M(.)$. This function summarizes the number of effective matches arising following the random contacts between vacant jobs and individuals having lost their job:

$$M(a, N_t) = a\delta N_t + (1-a)\delta N_t \phi(N_t, a, \delta) \tag{2.1}$$

where δN_t stands for the number of individuals having lost their job at the beginning of the period and receiving information on a vacant job either directly from a firm ($a\delta N_t$ in the matching function) or indirectly through social interactions ($(1-a)\delta N_t \phi(N_t, a, \delta)$ in the matching function). The function $\phi(N_t, a, \delta)$ is interpreted as the probability of hearing of a job through social interactions and depends on both the size of the social network and labor market conditions.

The total number of jobs which are available in the network to be passed, *i.e.* the number of job offers received by network members who are already employed, equals $a(1-\delta)N_t$. The number of potential recipients, *i.e.* those who are unemployed at the beginning of the period after the exogenous breakup has occurred, equals δN_t. If employees send offers at random, then the number of offers received by a given job seeker follows a binomial that converges to a Poisson. The probability to receive at least one offer through the network is $\phi(N_t, a, \delta) = 1 - e^{-\frac{a(1-\delta)N_t}{\delta N_t}} = 1 - e^{-\frac{(1-\delta)a}{\delta}}$ where $\frac{\partial \phi(N_t,a,\delta)}{\partial a} > 0$ and $\frac{\partial^2 \phi(N_t,a,\delta)}{\partial a^2} < 0$.

The network matching rate is therefore represented by:

$$NetMat = \frac{(1-a)\delta N_t \phi(N_t, a, \delta)}{M(a, N_t)} = \frac{1}{1 + \frac{a}{1-a}\frac{1}{\phi(N_t, a, \delta)}} \tag{2.2}$$

where the numerator stands for the number of matches that takes place through the network in period t and the denominator corresponds to the total number of matches in t. We seek to analyze the progression of the network matching rate during expansion/recession periods. Therefore, the effect we would like to estimate corresponds to:

$$\frac{\partial NetMat}{\partial a} = -NetMat^2 \frac{1}{(1-a)\phi(N_t, a, \delta)} \Big(\frac{1}{1-a} - \eta_a^{\phi} \Big) \tag{2.3}$$

where η_a^{ϕ} stands for the elasticity of the probability to receive a job offer through the network:

$$\eta_a^{\phi} = \frac{\partial \phi(N_t, a, \delta)}{\partial a} \frac{a}{\phi(N_t, a, \delta)} = \frac{(1-\delta)a}{\delta} \frac{e^{-\frac{(1-\delta)a}{\delta}}}{1 - e^{-\frac{(1-\delta)a}{\delta}}}$$

For a fixed network size, $a \in (0,1)$ and $\delta \in (0,1)$ it is easy to see that $\eta_a^{\phi} < \frac{1}{1-a}$. As a consequence, the derivative $\frac{\partial NetMat}{\partial a}$ is negative meaning that the proportion of people finding a job through social contacts decreases with the parameter a. In what follows, we will test the relevance of this prediction on the population of immigrants using French data. The case of France is particularly interesting since according to Hairault et al. (2015), in France the job finding rate explains more than 65% of unemployment dynamics over the past decade. This, combined with the strictness of the employment protection legislation in France justifies our focus on the job finding rate as an indicator of the economic cycle while assuming a constant δ.

3. Data, variables and descriptive statistics

For our empirical analysis, we use data from the French Labor Force Surveys (LFS) for the period going from 2003 to 2012. For this period we have consistent and reliable information on occupations, on whether the individual has found the job through social interactions, country of birth and year of arrival in France for immigrants. The LFS was launched in 1950 and established as an annual survey in 1982. We start our analysis in 2003 which is the year when the LFS was redesigned as a continuous survey with quarterly interviews of people. Participation is compulsory and all individuals living in the same dwelling and older than 15 are surveyed. [9]

9. The collection method has always been a face-to-face interview. Since 2003, a telephone interview has been employed for intermediate surveys (2nd to 5th).

The main topics covered by the LFS concern employment, unemployment, underemployment, hours of work, wages, duration of employment and unemployment (length of service), discouraged workers, industry, occupation, status in employment, education/qualification, and secondary jobs. The French LFS provides the occupation for each employed individual at the four-digit level. To ensure a sufficient number of observations for every occupation, we will consider the two digit occupation classification (provided by the two first digits of the code associated with each occupation defined at four digit level), which leads us to consider 24 occupations, referred as jobs all along the paper. [10]

We stop our analysis in 2012 since afterwards there is no detailed information on the respondent's country of birth. We exploit yearly changes in the probability to find a job through social networks with respect to yearly changes in the job finding rate, in order to identify the correlation between both variables. Even if the LFS allows to consider new hirings by isolating people who have been in the job for less than a year, the fact of working with survey data and not census makes this approach not possible because of the lack of observations, particularly when we consider immigrants from different origins. [11] We will though make a focus on people with less than 3 years of seniority in the job (*i.e.* 2 years of seniority or less in the job), which corresponds to hirings over the past two years.

We consider the employed population between 15 and 64 years old. For all our analysis we adopt the region as the unit of analysis for two main reasons. First, the job finding rate (which will be our cycle indicator) is only available at the regional level. Second, it allows us to guarantee a sufficient number of observations even when considering detailed categories of immigrants. France includes 22 regions.

For the econometric analysis we then exploit variability across 22 regions and 24 jobs. We consider the nine following groups of birth country : (1) North Africans: Algerian, Tunisian, Moroccan, (2) Africans: all other African countries, (3) Turkish: Turkey, (4) South-East-Asian: Vietnamese, Cambodian, Laotian, (5) South-Europeans: Italian, Portuguese, Spanish, Greek, (6) Central-North Europeans: German, Belgian, Dutch, Luxembourg, Irish, Danish, British, Swiss,

10. We exclude from our sample farmers, civil servants, military and clergymen.

11. In contrast with most papers on migration (see Ortega and Verdugo, 2014 or Patel and Vella, 2013b), we rely on survey data and not census data. Indeed, the French database resulting from matching French Census with individual social security data ("Declaration Annuelle Donnees Sociales") fails to provide some of the information we require for our analysis. For example, occupations are not consistently reported and there is no information on the use of social networks to find a job.

Austrian, Norwegian, Swedish, (7) Eastern Europeans and Russians, (8) South-Americans and (9) North-Americans.

Table 2.1 – Descriptive statistics of the sample by region

Region	Network matching rate	Proportion of immigrants	Origin of immigrants			Number of observations
			Europe	Africa	Other	
Ile-de-France	0.258	0.211	0.272	0.532	0.196	44,262
Champagne-Ardenne	0.217	0.065	0.332	0.470	0.198	7,471
Picardie	0.231	0.058	0.356	0.496	0.147	8,455
Haute-Normandie	0.240	0.045	0.312	0.543	0.145	8,741
Centre	0.224	0.067	0.413	0.443	0.144	9,036
Basse-Normandie	0.186	0.024	0.287	0.547	0.166	6,097
Bourgogne	0.231	0.070	0.495	0.399	0.106	7,526
Nord-Pas-de-Calais	0.232	0.046	0.397	0.478	0.125	18,635
Lorraine	0.232	0.080	0.508	0.285	0.207	8,543
Alsace	0.238	0.105	0.449	0.307	0.245	8,326
Franche-Comté	0.205	0.072	0.333	0.468	0.199	6,503
Pays de la Loire	0.227	0.032	0.208	0.548	0.245	13,882
Bretagne	0.209	0.028	0.306	0.472	0.222	8,480
Poitou-Charentes	0.201	0.041	0.525	0.387	0.088	6,564
Aquitaine	0.241	0.080	0.417	0.449	0.133	8,903
Midi-Pyrénées	0.206	0.082	0.320	0.518	0.162	7,969
Limousin	0.209	0.057	0.366	0.487	0.147	5,000
Rhône-Alpes	0.221	0.106	0.386	0.455	0.159	21,745
Auvergne	0.199	0.058	0.447	0.354	0.198	5,182
Languedoc-Roussillon	0.257	0.113	0.276	0.624	0.100	6,552
Provence-Alpes Côte d'Azur	0.287	0.160	0.259	0.644	0.097	14,414
Corse	0.328	0.216	0.485	0.504	0.011	517
All regions	0.235	0.105	0.323	0.507	0.170	232,803

Source: Data from Labor Force Surveys 2003-2012.

After pooling all the year-specific datasets, we obtain a sample comprising 232,803 respondents for the period 2003-2012. As shown in Table 2.1, this workforce is very unequally distributed across regions, with Ile de France being by far the most workforce abundant region, followed by Rhone Alpes, Nord-Pas-de-Calais, Provence-Alpes Cote d'Azur (PACA) and Pays de la Loire. The

average share of immigrants in the employed population equals 10.5%. The sample includes 24,485 foreign born workers. Six regions have a proportion of immigrant workforce above or equal to the average: Corse (21.5%), Ile de France (21.1%), PACA (16.1%), Languedoc-Roussillon (11.3%), Rhône-Alpes (10.6%) and Alsace (10.5%). Moreover, the internal composition of the immigrant population strongly differs across regions. While in Ile de France 27% of the immigrant workforce is European, 53% African and around 20% from other origins, in PACA these proportions are equal to 26%, 64% and 10% and in Rhône-Alpes they are equal to 39%, 45% and 16%. Finally, the proportion of employed individuals claiming to have found a job through social connections varies from 33% in Corse, 28.7% in PACA or 25.8% in Ile de France, to 18.6% in Basse Normandie, 19.9% in Auvergne or 20% in Poitou-Charentes.

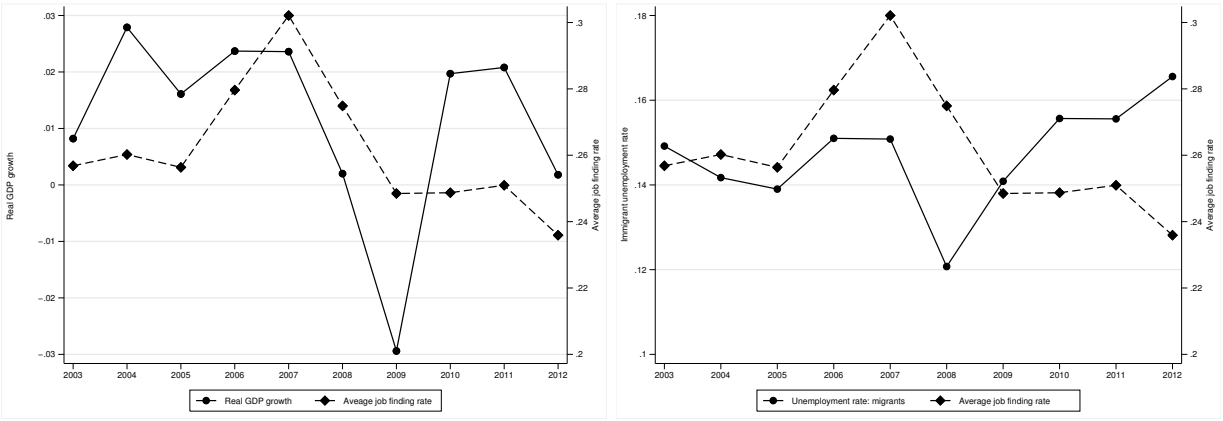
In our study, the job finding rate is used as an indicator of the economic cycle. Based on the estimations of Hairault et al. (2015) and given the strictness of the employment protection legislation in France, we argue that the job finding rate at the regional level is a good indicator of the economic cycle, *i.e.* it summarizes well the evolution of labor market conditions. The job finding rate in period t, which is defined as the probability of transition from unemployment to employment, is calculated using quarterly data (which is the highest frequency available in the French LFS) at the regional level on the flows of workers into and out of unemployment between $t-1$ and t.[12] In order to reduce time aggregation biases, we calculate the job finding rate following Shimer (2012) so as to take into account the problem that, while data is available only at discrete date, the underlying environment keeps changing over time. Taking yearly averages, we obtain an average job finding rate per region.[13]

The positive correlation between the economic cycle and the job finding rate is clearly displayed on the left-hand side panel of Figure 2.1. We find that overall the job finding rate follows the evolution of GDP growth. Note though that, whereas decreases in GDP growth, as in 2008-2009, are directly associated with equivalent decreases in the job finding rate, recoveries in GDP growth do not induce equivalent recoveries in the job finding rate. Our cycle indicator displays therefore

12. We thank Idriss Fontaine for providing us with all the prepared data to compute the job finding rates. For further details, see Fontaine (2016).

13. In our study we consider a unique job finding rate per region, without distinguishing by worker skill level. Considering the job finding rate by skill level has at least two major drawbacks. On the one hand, mobility across regions differs between skilled and unskilled workers, which is likely to affect the estimation of the job finding rate. On the other hand, while high-skilled workers may apply to low-skilled positions and be hired on them, the opposite is unlikely to happen. The job finding rate of high-skilled workers must then be necessarily higher than that of low-skilled workers.

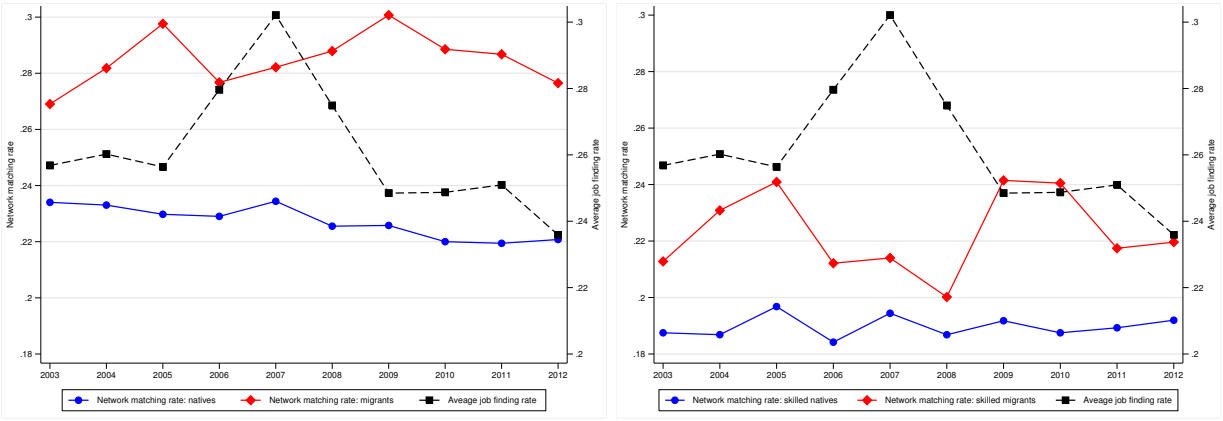
Figure 2.1 – Relationship between real GDP growth and job finding rates



Source: Data on job finding rates comes from Fontaine (2016). Data on GDP growth is provided by the French National Statistical Institute. Data on the immigrant unemployment rate is computed from French Labor Force Surveys (2003-2012).
Note: The y-axis on the left hand side stands for real GDP growth rates when considering the left-hand side panel and for immigrants' unemployment rate when considering the right hand side panel. The y-axis on the right-hand side stands for job finding rates on both panels.

a smoother progression than GDP growth. Furthermore, as shown by the right-hand side panel of Figure 2.1, higher job finding rates during period t translate into decreases in immigrants' unemployment rate in period $t+1$, and vice-versa, reduced job finding rates are associated with unemployment increases.

Figure 2.2 – Relationship between the network matching rate and the job finding rate



Source: data on the network matching rate comes from French Labor Force Surveys (2003-2012). Data on the job finding rate is provided by Fontaine (2016).
Note: the y-axis on the left hand side stands for the share of natives and immigrants (separately) that declares having found a job through social interactions. The y-axis on the right-hand side stands for the job finding rate rate.

Figure 2.2 displays the progression between 2003 and 2012 of both the job finding rate per year and the share of employed natives and immigrants that declares having found a job through

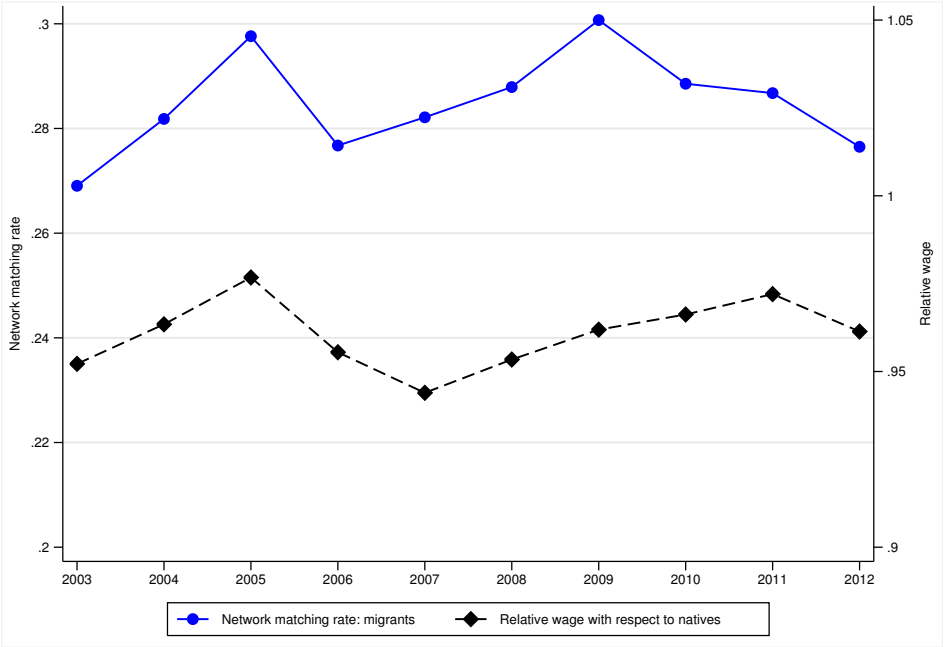
friends, relatives or colleagues. While the left-hand side panel considers all individuals, the right hand side panel focuses on people having at least secondary education. In both cases, the y-axis on the left-hand side represents the proportion of individuals (natives and immigrants, respectively) claiming to have found a job through social interactions, while the y-axis on the right-hand side represents the job finding rate.

Several conclusions can be drawn from Figure 2.2. First, the network matching rate is clearly more important for the immigrant population than for the native population, confirming that peer effects are particularly relevant for the former subgroup. Second, the network matching rate is lower among high skilled workers. Third, while the network matching rate of natives has followed a smoothly decreasing trend since 2004, for immigrants the relatively high job finding rates during the period 2005-2008 are associated with an increase in the network matching rate, while the subsequent decrease in the job finding rates induce also a decrease in the network matching rate. This result is though driven by unskilled immigrants, since the share of skilled immigrant workers declaring having found a job through social networks decreases when the job finding rate increases and vice-versa (see right-hand side panel). The diverging behavior of the native and immigrant network matching rate for identical changes in the job finding rate suggests that networks do not operate along the same dimensions for natives and immigrants, underlining the importance of making a focus on the immigrant population subgroup. As shown by Figure 2.3, there is a positive correlation between the immigrants' network matching rate and the immigrants' relative wage with respect to natives. This suggests that the increased use of social networks to find a job may improve immigrants' relative performance in terms of wages with respect to natives.

We consider two different indicators of the network matching rate. First, due to the fact that we are considering survey data and not census data, we cannot exactly estimate equation 2.2. We employ the French LFS since it is the unique population representative database which precisely asks the individual how did she find the job in the firm. Among the possible answers there is "through family relations, personal relations or professional relations". The French LFS is though a sequence of non-exhaustive quarterly cross-sections that does not allow to rigourously compute hirings per period t, which stands for the denominator in equation 2.2.

For the same reason, we are unable to compute the numerator, since it corresponds to the number of new hirings during period t that took place through social networks. We propose then an indicator of the network matching rate which proxies equation 2.2 using stock variables, which are available in the LFS.

Figure 2.3 – Relationship between the immigrants' network matching rate and the immigrants' relative wage with respect to natives



Source: data on both the immigrant network matching rate and the relative wage of immigrants with respect to natives are computed from French Labor Force Surveys (2003-2012). Note: the y-axis on the left hand side stands for the share of immigrants that declares having found a job through social interactions. The y-axis on the right-hand side stands for the ratio between the native and the immigrant average real hourly wage per year.

Instead of considering the share of hirings in period t having found the job through social networks (equation 2.2) we consider the share of employed people in period t that has found a job through social networks: [14]

$$\text{Estimated } NetMat = \frac{\text{Nb. employed in period t having found a job through social networks}}{\text{Nb. employed in period t}} \tag{2.4}$$

We exploit yearly variation in this indicator with respect to yearly variation in the job finding rate in order to estimate the relationship between the share of employed people (immigrants in our case) finding a job through social networks and the economic cycle. According to our theoretical framework, the share of new hirings having found the job through social networks is decreasing in the job offer rate a. Therefore, we also expect the share of employed people having found a job

14. Both outcomes (ie. share of hirings and share of employed people) are obviously expected to be strongly positively correlated

through networks to decrease as a increases, particularly since we will estimate this relationship exploiting yearly variations in both variables. As stated above, in the econometric analysis we also consider as an independent variable the share of employed people in period t that has found a job through social networks and that less than 3 years of seniority in that job. This is the best proxy we can have for new hires. [15]

For our second indicator we do not require a direct recommendation from a network member. It measures the proximity between jobs occupied by immigrants and the most popular job among their peers in the region. Our indicator is inspired from the one proposed in Patel and Vella (2013b) to measure the importance of social networks on immigrants' occupational choices. In their paper, Patel and Vella (2013b) consider the probability that the immigrant is employed in the most popular job among her peers in the corresponding federal state. We generalize here this indicator and we consider the whole set of jobs where "established immigrants" from origin o in region g are present. That is, from the total immigrant population, we are going to exclude immigrants with less than 6 years of residence in France. The remaining sample is then uniquely composed by "established immigrants". We use this sample to compute for every origin in every region the set of jobs where these immigrants are present.

For every origin o and in each region g, we rank the jobs where "established immigrants" are present from the most popular one to the least popular one. More precisely, if in region g, people from origin o are present in M different types of jobs, we will give a rank equal to M to the job where the number of "established immigrants" from origin o is the most numerous, a rank equal to $M-1$ to the job where the number of "established immigrants" from origin o is the second most numerous, and so on. The last job in the ranking will be the job in the region where the number of "established immigrants" from o is the least numerous and its rank equals 1. Therefore, in every region, for every year and for every considered origin, we will have a specific set of jobs ranked from M for the most popular job to 1 for the least popular job of the considered origin in the region.

We then define for every immigrant i with less than 6 years of residence in the host country and for every immigrant i with less than 3 years of seniority in the current job a variable $Dist_{iogjt}$ capturing the distance between the ranking of the job where the individual is employed in region g and the most popular job among the established peers in region g. The distance is smaller the closer the individual is employed with respect to the most popular job of the established peers in

15. When considering less than two years of seniority the number of observations is too low.

the region. Distance is then defined as:

$$Dist_{iogjt} = RPopular_{ogt} - R_{iogjt} \tag{2.5}$$

where $RPopular_{ogt}$ stands for the ranking of the most popular job of "established immigrants" from origin o in region g at date t, *i.e.* if in period t "established immigrants" from origin o in region g are present in $M = 20$ different jobs in the region, the ranking of the most popular job for this population subgroup will be equal to $RPopular_{ogt} = 20$. R_{iogjt} stands for the ranking of the job where immigrant i (with less than 6 years of residence or/and less than 3 years of seniority) from origin o in region g is employed. We normalize between 0 and 1 this distance and compute our proximity indicator $ExJobI_{iogjt}$ as one minus the normalized distance:

$$ExJobI_{iogjt} = 1 - \frac{Dist_{iogjt} - Min\{Dist_{ogjt}\}}{Max\{Dist_{ogjt}\} - Min\{Dist_{ogjt}\}} \tag{2.6}$$

The closer $ExJobI_{iogjt}$ is to unity, the closer the immigrant with less than 6 years of residence in the host country or/and less than 3 years of seniority in the current job is to the most popular job of the established peers in the region.

Contrary to our first indicator which only considers direct recommendations from social contacts, our second indicator focuses on potential positive externalities that the massive presence of individuals of certain geographical origin in a certain job may have on the employability of their peers. The individual does not need then an explicit recommendation from a friend or relative already employed in that job, the fact of being a peer increases the chances to obtain the job. In an involuntary way, the individual belongs to a social network associated with the own geographical origin that increases the employment probability in that job (because it facilitates communication, reduces cultural distance, etc). This is the idea behind the largely diffused instrument in the migration literature which uses the historical settlement of immigrants to predict current geographical locations and occupations (see Altonji and Card, 1991, Card, 2001, Card, 2009, Cortes and Tessada, 2011, D'Amuri and Peri, 2014 or Moreno-Galbis and Tritah, 2016).

4. Econometric strategy

We estimate the varying role of the network matching rate along the economic cycle. We work with survey data so that we build our indicators using stock variables rather than flows. We exploit

though yearly variations in the stock variables to estimate the relationship between the network matching and the job finding rate. We consider three different population subgroups: (*i*) the whole population of immigrants, (*ii*) immigrants having arrived in France less than 6 years ago and (*iii*) immigrants having less than 3 years of seniority in their current job (which corresponds to hirings over the two past years). We test the robustness of our results over the corresponding skilled immigrant population.

We define the network matching rate as the probability P_{iogjt} that the individual i from origin o living in region g and occupied in job j declares having found the job through social interactions (which corresponds to the indicator defined in equation 2.4) and estimate the followinglinear probability model:

$$P_{iogjt} = \gamma_0 + \gamma_1 a_{gt} + \gamma_t + \gamma_o + \gamma_j + \gamma_{ot} + \gamma_{oj} + \gamma_{jt} + \epsilon_{ogjt} \tag{2.7}$$

where a_{gt} represents the job finding rate in region g at date t. According to the model's prediction, the network matching rate should be decreasing in this job finding rate. As a robust test, we also propose a more flexible specification including a quadratic profile of the job finding rate to allow for a non monotonic relation between the network matching rate and labor market conditions.

We control for year, origin and job fixed effects (γ_t, γ_o and γ_j, respectively). The formers allow to control for aggregate shocks while origin fixed effects capture systematic differences in the importance of the network matching rate across origins. This allows to control for differences in the network size across origins and for systematic discrimination against some of the origins. Job fixed effects allow to control for systematic differences in our network matching rate indicator across jobs.

We also consider fixed effects year-origin, job-year and job-origin (γ_{ot}, γ_{jt} and γ_{oj}, respectively). Origin-year fixed effects allow for differential shocks across origins, which may induce different evolutions on the size of the network across origins or may respond to discriminatory shocks. Job-year fixed effects control for specific shocks that may affect one particular job due to a technological innovation or change in the productive structure. Job-origin fixed effects account for the systematic concentration of some origins in certain types of jobs.

To identify the effect of the economic cycle on the network matching rate, we exploit time variation in the individuals' probability to find a job through social connections as a function of

time variation in the job finding rate in the region where the individual lives. By controlling for year fixed effects, we capture the part of the network matching rate variation that is common to all individuals in all regions. [16] The remaining variability in the network matching rate is then specific to the individual and to the socioeconomic environment where the individual lives, which is the region in our case. It seems then intuitive to relate this individual and region specific component of the network matching rate to the job finding rate of the region where the individual lives. In doing so, we estimate the correlation between both variables. We do not have enough variability to estimate individually regional fixed effects and the coefficient of the regional job finding rate.

Because serial correlation within a particular labor market may be a concern, in all regressions we adjust standard errors for clustering of observations at the region-year level. We also use weighted regressions with weights provided by the LFS.

For our second indicator we estimate a similar equation:

$$ExJobI_{iogjt} = \gamma_0 + \gamma_1 a_{gt} + \gamma_t + \gamma_j + \gamma_o + \gamma_{ot} + \gamma_{oj} + \gamma_{jt} + \epsilon_{ogjt} \tag{2.8}$$

where the closer $ExJobI_{iogjt}$ is to unity, the closer the immigrant is to the most popular job of the established peers in the region; a_{gt} represents the job finding rate in region g at date t. We control for aggregate shocks through year fixed effects γ_t. We control for systematic differences across jobs and origins through the introduction of job and origin fixed effects, γ_j and γ_o. We allow aggregate shocks to be origin-specific and job-specific (γ_{ot} and γ_{jt} respectively), and we control for the potential tendency of some origins to cluster into certain types of jobs by considering origin-job fixed effects γ_{oj}. Again, we use weights provided by the LFS and adjust standard errors for the clustering of observations at the region-year level.

5. Results

In a first step, we use the traditional definition of the network matching rate based on direct recommendations. Panel A of Table 2.3 considers all individuals while Panel B considers only individuals having at least secondary education (*i.e.* skilled individuals). Moreover, within each panel, we implement separate regressions over the whole population of immigrants, recently arrived

16. The common component could actually be driven by policy measures adopted by the central government or institutional reforms. As sown latter in the paper, estimation results do not essentially differ when including or not year fixed effect and their interactions.

immigrants with less than 6 years of residence and immigrants with less than 3 years seniority in their job. Columns (1)-(3) and columns (7)-(9) in Table 2.3 present linear probability estimation results from equation 2.7. Columns (4)-(6) and (10)-(12) allow for a quadratic profile. We estimate the relationship between the probability that the immigrant has found the job through a direct recommendation of a social connection and the job finding rate. We introduce as control variables the age and age squared of the individual, sex, educational level and marital status.

Columns (1)-(3) from Panel A reveal a negative and significant correlation between the network matching rate and the job finding rate when considering all immigrants or those with less than 3 years seniority in the job. For immigrants with less than 6 years of residence in France the coefficient is not significant. An increase from the first to the third quartile of the job finding rate distribution (which corresponds to an increase by 34.7% in the job finding rate) correlates with a decrease in the probability of finding a job through a direct recommendation by 15.35% when considering all immigrants and by 15.24% when considering immigrants with less than 3 years of seniority.

Table 2.2 – Estimates of the network matching rate based on direct ties. Individual data approach. No year fixed effects.

Dependent variable: network matching rate

	Panel A: Probability that the individual has found the job through direct ties						Panel B: Probability that the skilled individual has found the job through direct ties					
	Benchmark estimation			Benchmark +quadratic profile			Benchmark estimation			Benchmark +quadratic profile		
	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Job finding rate	-0.594***	-0.558**	-0.657***	-1.789***	-1.914	-2.123*	-0.467***	-0.820***	-0.625***	-2.218**	2.570	-2.874*
	(0.082)	(0.225)	(0.156)	(0.659)	(1.877)	(1.116)	(0.125)	(0.296)	(0.211)	(1.058)	(2.543)	(1.584)
Job finding rate^2				2.207*	2.457	2.716				3.221*	-6.096	4.157
				(1.229)	(3.377)	(1.978)				(1.930)	(4.432)	(2.874)
Fixed Effects												
Origin	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Job	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Origin*Year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Origin*Job	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Job*Year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Individual Controls (age, age^2, married, female, educ)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	24,480	2,305	5,929	24,480	2,305	5,929	9,542	1,177	2,686	9,542	1,177	2,686
R-squared	0.163	0.408	0.292	0.163	0.408	0.292	0.247	0.536	0.429	0.248	0.537	0.429

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: estimates from linear regression models, with robust standard errors clustered at the region-year level. Weights equal standard individual weights provided by the French Labor Force Survey. Individual characteristics include age, age^2, marriage, gender and education level. Origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. Significance levels are $***(p < 0.01)$, $**(p < 0.05)$ and $*(p < 0.1)$.

In columns (4)-(6) from Panel A, we allow for a quadratic relationship between the probability of finding a job through a social network and the job finding rate. In this case, we find a decreasing

and convex relationship between the probability of finding a job through social networks and the job finding rate when considering the whole immigrant population. The relationship becomes linearly decreasing when considering immigrants with less than 3 years seniority in their job. These findings remain robust when focusing exclusively skilled immigrants (Panel B). Furthermore, when considering skilled immigrants with less than 6 years of residence in France, a significant and decreasing relationship also arises. Results remain robust if we do not include year fixed effects and their interactions (Table 2.2). For skilled immigrants, an increase from the first to the third quartile of the job finding rate distribution is associated with a decrease by 12.44% in the probability of finding a job through a direct recommendation for all skilled immigrants, by 33.66% when considering recently arrived skilled immigrants and by 24.47% for skilled immigrants with less than 3 years of seniority in the job. These negative values are an average larger (in absolute terms) than when considering the whole population of immigrants, suggesting that the network matching rate of skilled workers relates more negatively to the job finding rate than the network matching rate of unskilled immigrants.

Table 2.3 – Estimates of the network matching rate based on direct ties. Individual data approach.

Dependent variable: network matching rate

	Panel A: Probability that the individual has found the job through direct ties						Panel B: Probability that the skilled individual has found the job through direct ties					
	Benchmark estimation			Benchmark +quadratic profile			Benchmark estimation			Benchmark +quadratic profile		
	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Job finding rate	-0.676***	-0.440	-0.702***	-1.970***	-2.912	-2.652*	-0.442***	-1.064*	-0.922***	-2.337**	-0.313	-3.862
	(0.095)	(0.313)	(0.188)	(0.682)	(2.357)	(1.378)	(0.134)	(0.628)	(0.337)	(1.115)	(5.182)	(2.705)
Job finding rate^2				2.384*	4.487	3.595				3.479*	-1.333	5.406
				(1.232)	(4.239)	(2.445)				(2.023)	(9.202)	(4.891)
Fixed Effects												
Origin	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Job	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Origin*Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Origin*Job	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Job*Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Individual Controls (age, age2, married, female, education)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	24,480	2,305	5,929	24,480	2,305	5,929	9,542	1,177	2,686	9,542	1,177	2,686
R-squared	0.237	0.605	0.450	0.237	0.606	0.450	0.379	0.807	0.653	0.379	0.807	0.653

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: estimates from linear regression models, with robust standard errors clustered at the region-year level. Weights equal standard individual weights provided by the French Labor Force Survey. Individual characteristics include age, age^2, marriage, gender and education level. Origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. Significance levels are $***(p < 0.01)$, $**(p < 0.05)$ and $*(p < 0.1)$.

Figures 2.4 and 2.5 provide the estimated marginal effects and confidence intervals at 95 percent

level from the derivative of equation 2.7 augmented by the quadratic profile :

$$\frac{\partial \ P_{iogjt}}{\partial \ \text{Job finding rate}} = \widehat{\gamma_1} + 2\widehat{\gamma_2} a_{gt} \tag{2.9}$$

The term $\frac{\partial \ P_{iogjt}}{\partial \ \text{Job finding rate}}$ changes along the job finding rate distribution since the derivative depends on a_{gt}, implying that we represent the distribution of marginal effects all along the distribution of the job finding rate.

Figure 2.4 reveals that for the whole population of immigrants and for immigrants with less than 3 years of seniority there is a negative and convex relationship between the probability of finding a job through a social connection and the job finding rate. In line with the model's predictions the relationship remains negative even if it seems to reach an inflexion point at the top of the job finding rate distribution when considering immigrants with less than 3 years of seniority in the job. In contrast, for immigrants with less than 6 years of residence in France the estimated marginal effects are not significantly different from zero all along the job finding rate distribution, confirming findings from Table 2.3.

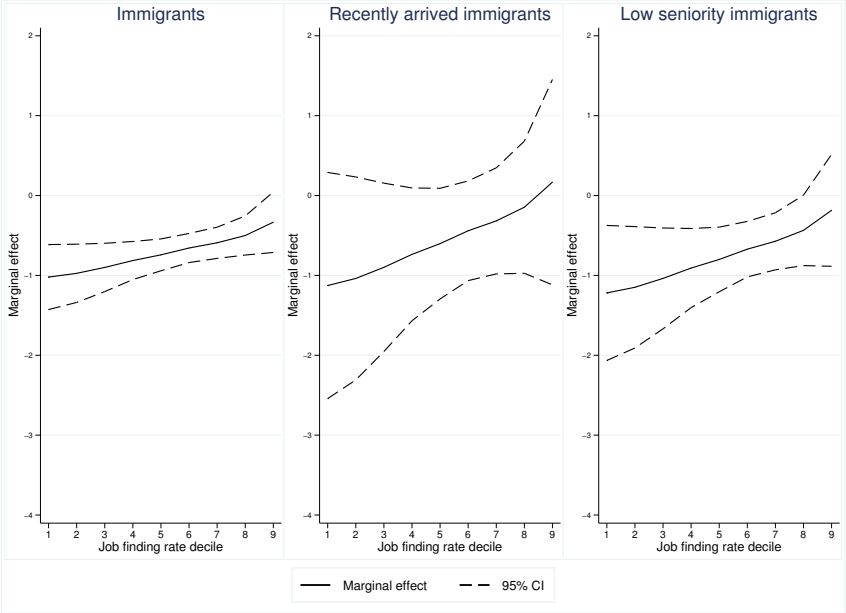
Figure 2.5 displays the marginal effects for skilled immigrants. When considering all skilled immigrants and skilled immigrants with less than 3 years of seniority in the job we still find a decreasing and convex relationship. For skilled immigrants with less than 6 years of residence in France the relationship between the probability to find a job through social networks and the job finding rate still remains not significantly different from zero.

Combining results from Table 2.3 with Figures 2.4 and 2.5, we conclude that consistently with the predictions of our theoretical setup, a decreasing relationship between the network matching rate and the job finding rate arises when we consider the whole population of immigrants or those who have been hired over the past two years. The probability that an immigrant finds a job through a social connection decreases, as the job finding rate starts increasing.

We conduct several additional tests in order to assess the robustness of our results. We first propose an aggregated data approach based on cells defined at the region-origin level. Consistently with the indicator defined in equation 2.4, we consider as a dependent variable the ratio between the number of individuals having found their job through social interactions in region g and the total number of employed people in the cell. We control by year and origin fixed effects as well as by their interaction.

Estimation results from the cell approach are summarized in Table 2.4. Again Panel A considers

Figure 2.4 – Individual data: predicted marginal effect of the job finding rate on the network matching rate along the job finding rate distribution



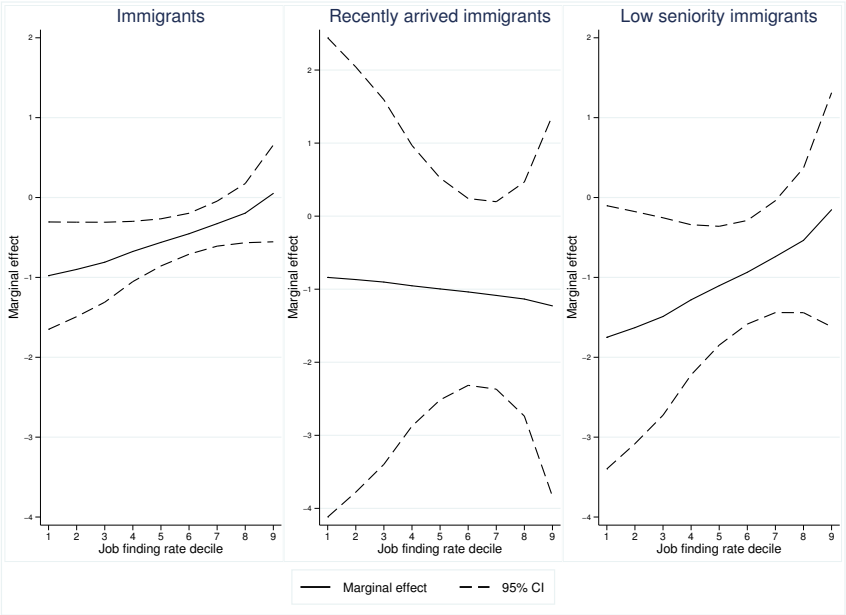
Source: authors' calculations, data from Labor Force surveys 2003-2012.

all individuals while Panel B considers only individuals having at least secondary education (*i.e.* skilled individuals). Moreover, within each panel, we distinguish between the whole population of immigrants, recently arrived immigrants with less than 6 years of residence and immigrants with less than 3 years seniority in their job. Panel A in Table 2.4 clearly suggest a negative correlation between the network matching rate and the job finding rate. Panel B displays also a decreasing relationship between the network matching rate and the job finding rate not only for the whole skilled immigrant population but also for skilled immigrants with less than 3 years seniority at their job.

Marginal effects of the job finding rate on the network matching rate are represented in Figures 2.6 and 2.7. Figure 2.6 reveals that when considering the whole population of immigrants and immigrants with less than 3 years of seniority, the marginal effects are negative but approach zero as we move up in the job finding rate distribution, suggesting that the relationship between the regional network matching rate and the job finding rate is decreasing and convex. For recently arrived immigrants, the estimated marginal effects are negative but not significantly different from zero along the job finding rate distribution.

Conclusions remain robust when we exclusively focus on the skilled population. As revealed by

Figure 2.5 – Individual data: predicted marginal effect of the job finding rate on the network matching rate of skilled employed along the job finding rate distribution



Source: authors' calculations, data from Labor Force surveys 2003-2012.

Figure 2.7 for all skilled immigrants and for those with less than 3 years of seniority the values of the marginal effects are significantly negative but increasing towards zero along the job finding rate distribution. For recently arrived immigrants, the marginal effect of the job finding rate is again negative but not significantly different from zero. Conclusions remain robust when we exclusively focus on the skilled population. As revealed by Figure 2.7 for all skilled immigrants and for those with less than 3 years of seniority the values of the marginal effects are significantly negative but increasing towards zero along the job finding rate distribution. For recently arrived immigrants, the marginal effect of the job finding rate is again negative but not significantly different from zero. Findings from Figures 2.6 and 2.7 are consistent with results obtained when exploiting individual data (see Table 2.3).

Due to the large number of origins we consider (9 different origins), when we use the region-origin cell approach the proportion of region-origin-year cells adopting the zero value is around 30%. To deal with this issue, we propose two alternative approaches. First, in Table 2.5, we aggregate immigrants into 3 large origins: African immigrants, European immigrants and Other origins. By reducing the number of origins we are artificially increasing the number of observations per origin, and thus per cell, decreasing in this way the proportion of region-origin-year cells adopting the zero

Table 2.4 – Estimates of the network matching rate based on direct ties. Region-origin cell approach.

Dependent variable: network matching rate

	Panel A: Share of individuals having found their job through direct ties (cell-approach)						Panel B: Share of skilled individuals having found their job through direct ties (cell-approach)					
	Benchmark estimation			Benchmark +quadratic profile			Benchmark estimation			Benchmark +quadratic profile		
	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Job finding rate	-0.773***	-0.444**	-0.629***	-2.664***	-1.982	-2.067*	-0.110	-0.364*	-0.678***	-3.268***	-0.433	-4.530***
	(0.098)	(0.195)	(0.136)	(0.672)	(1.873)	(1.171)	(0.187)	(0.214)	(0.166)	(0.784)	(2.011)	(1.336)
Job finding rate^2				3.478***	2.828	2.642				4.931***	0.126	7.036***
				(1.236)	(3.349)	(2.046)				(1.404)	(3.500)	(2.348)
Fixed Effects												
Origin	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Job	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Origin*Year	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO
Origin*Job	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Job*Year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Individual Controls (age, age2, married, female, education)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Observations	1,583	769	1,167	1,583	769	1,167	220	180	206	220	180	206
R-squared	0.263	0.337	0.222	0.270	0.338	0.223	0.029	0.100	0.095	0.221	0.100	0.127

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: OLS estimates from linear regression models, with robust standard errors clustered at the region level. Weights equal total population of the corresponding region-origin-year cell. In panel A, origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. In panel B, origin fixed effects distinguish between natives and immigrants since when considering the skilled population we need to aggregate all immigrants' origins to ensure a sufficient number of observations. Significance levels are $***(p < 0.01), **(p < 0.05)$ and $*(p < 0.1)$.

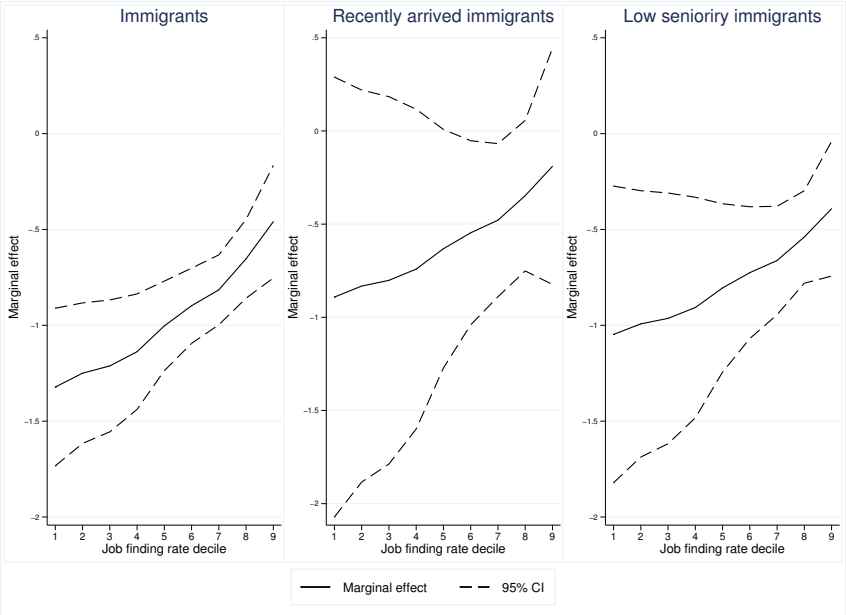
value. Estimation results in Table 2.5 are consistent with estimations reported in Table 2.3. We find a decreasing (and convex) relationship between the network matching rate and the job finding rate when considering all immigrant population and immigrants with less than 3 years of seniority in the job. Similar conclusions are drawn when focusing on skilled immigrants.

An alternative approach to deal with region-origin-year cells adopting the zero value consists in focusing only in regions having a proportion of immigrants above the average.[17] Table 2.6 displays the results when considering uniquely immigrant-abundant regions. Again, consistently with estimations in Table 2.3 we find that when considering all immigrants and immigrants with less than 3 years seniority the relationship between the network matching rate and the job finding rate follows a decreasing profile. When considering skilled immigrants, the relationship remains decreasing (and convex).

All in all, combining the whole set of estimation results in Table 2.3, in Figures 2.4, 2.5 and various robustness tests, we can conclude that consistently with predictions from our theoretical setup, the probability that immigrants find a job through direct recommendation decreases during economic expansions, as the job finding rate rises. The relationship is decreasing for both all im-

17. Corse, Ile de France, PACA, Languedoc-Roussillon, Rhône-Alpes and Alsace.

Figure 2.6 – Predicted marginal effect of the job finding rate on the regional network matching rate along the job finding rate distribution

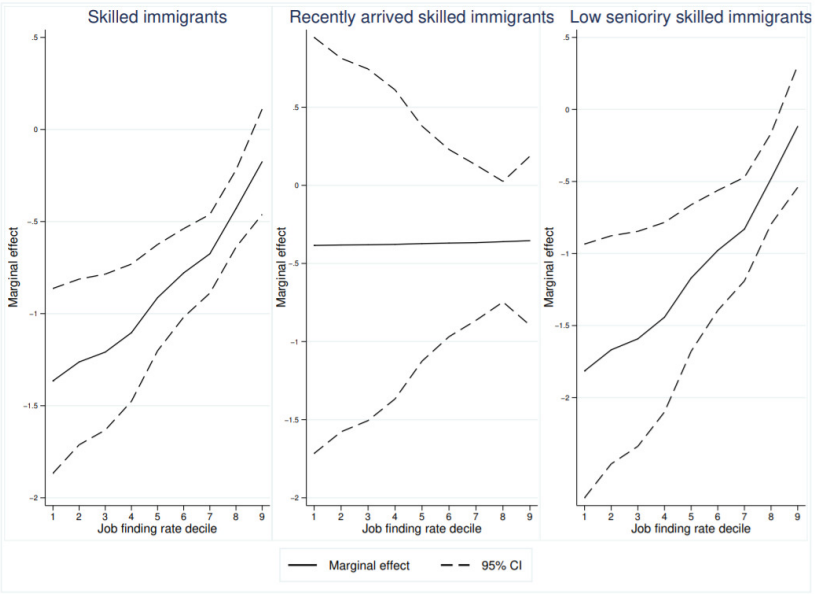


Source: authors' calculations, data from Labor Force surveys 2003-2012.

migrants and immigrants who have recently found a job (less than 3 years seniority) independently on the skill. This relationship does not hold though for recently arrived immigrants. This may be explained by the nature of this population subgroup. Among recently arrived immigrants we include those with 5 or less years of residence in the host country. Within this group, we may find individuals that have already been working in the same firm for 4 or 5 years as well as individuals with less than 1 or 2 years seniority. This heterogeneous composition together with the reduced number of observations may cancel the potential relation between the economic cycle and the network matching rate.

Our second indicator of the network matching rate is inspired from the one proposed in Patel and Vella (2013b), but in our paper we take into account the fact that different origins may be more or less concentrated among jobs across regions. The intuition behind our indicator is that a large share of immigrants from origin o in a job should improve the matching efficiency of individuals from origin o in that job due to cultural proximity. We are not able to anticipate though the relationship between the proximity to the most popular job of the individual's peers in the region and the job finding rate. On the one hand, during expansion periods (for high job finding rates) the matching probability of individuals from origin o may increase relatively more in jobs where

Figure 2.7 – Predicted marginal effect of the job finding rate on the regional network matching rate of skilled employed along the job finding rate distribution



Source: authors' calculations, data from Labor Force surveys 2003-2012.

Table 2.5 – Estimates of the network matching rate based on direct ties. Region-origin cell approach with 3 aggregate origins (African, European and Other).

Dependent variable: network matching rate

	Panel A: Share of individuals having found their job through direct ties (cell-approach)						Panel B: Share of skilled individuals having found their job through direct ties (cell-approach)					
	Benchmark estimation			Benchmark +quadratic profile			Benchmark estimation			Benchmark +quadratic profile		
	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Job finding rate	-0.776***	-0.385**	-0.709***	-2.713***	-0.132	-2.868***	-0.580***	-0.180	-0.468**	-3.218***	1.206	-5.418***
	(0.102)	(0.177)	(0.126)	(0.684)	(1.804)	(1.085)	(0.106)	(0.248)	(0.219)	(0.783)	(2.405)	(1.718)
Job finding rate^2				3.564***	-0.464	3.963**				4.830***	-2.538	9.027***
				(1.254)	(3.225)	(1.906)				(1.402)	(4.308)	(3.173)
Fixed Effects												
Origin	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Job	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Origin*Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Origin*Job	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Job*Year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Observations	649	488	605	649	488	605	627	356	482	627	356	482
R-squared	0.242	0.123	0.156	0.257	0.123	0.162	0.122	0.150	0.102	0.139	0.151	0.122

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: OLS estimates from linear regression models, with robust standard errors clustered at the region level. Weights equal total population of the corresponding region-origin cell. Origin fixed effects correspond to Africans, Europeans, Others. Significance levels are $***(p < 0.01), **(p < 0.05)$ and $*(p < 0.1)$.

Table 2.6 – Estimates of the network matching rate based on direct ties: regions having a proportion of immigrants above the average.

Dependent variable: network matching rate

	Panel A: Share of individuals having found their job through direct ties						Panel B: Share of skilled individuals having found their job through direct ties					
	Benchmark estimation			Benchmark +quadratic profile			Benchmark estimation			Benchmark +quadratic profile		
	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3	All	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Job finding rate	-0.929***	-0.429	-0.593***	-2.947***	-1.402	-0.303	-0.663***	-0.200	-0.715***	-3.039**	-0.945	-2.666
	(0.097)	(0.280)	(0.100)	(0.979)	(3.779)	(2.561)	(0.138)	(0.287)	(0.186)	(1.474)	(3.177)	(2.252)
Job finding rate^2				3.675**	1.771	-0.527				4.359	1.365	3.578
				(1.796)	(6.703)	(4.447)				(2.696)	(5.640)	(3.936)
Fixed Effects												
Origin	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Job	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Origin*Year	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO
Origin*Job	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Job*Year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Observations	420	283	364	420	283	364	382	371	382	382	371	382
R-squared	0.527	0.463	0.413	0.534	0.464	0.413	0.493	0.300	0.329	0.533	0.301	0.340

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: OLS estimates from linear regression models, with robust standard errors clustered at the region level. Weights equal total population of the corresponding region-origin-year cell. In panel A, origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. In panel B, origin fixed effects distinguish between natives and immigrants since when considering the skilled population we need to aggregate all immigrants' origins to ensure a sufficient number of observations. Significance levels are $***(p < 0.01), **(p < 0.05)$ and $*(p < 0.1)$.

there is a large share of their peers. On the other hand, during expansion periods immigrants may find more easily jobs outside the traditional jobs occupied by their peers, because there are more employment opportunities available in the market.

Estimation results of equation 2.8 are summarized in Table 2.7. When considering immigrants with less than 6 years of residence in France a significant linearly decreasing relationship arises. For recently hired immigrants (less than 3 years seniority) the relationship is also decreasing. These results remain robust when focusing on skilled immigrants (Panel B). An increase from the first quartile to the third quartile of the job finding rate distribution is associated with a decrease in the proximity to the most popular job by 20.71% for recently arrived immigrants and by 20.06% for recently hired immigrants. When considering skilled people the decrease equals 49.79% and 36.10%, respectively. In line with estimations from Table 2.3, the network matching rate indicator based on proximity to the most popular job of the peers in the region also predicts that the network matching rate of skilled workers relates more negatively with the job finding rate than the network matching rate of unskilled workers.

The important loss of observations when considering only recently arrived and recently hired immigrants, may lead to a loss in precision in our estimations. To deal with this issue we propose the two approaches already applied in Tables 2.5 and 2.6. First we aggregate into 3 origins our immigrant population. The main drawback of this approach is that we are mixing people from very different origins and this may cancel origin-individual effects. The second approach consists in focusing only on regions that have a share of immigrants above the average. This should lead to an improvement in the quality of our estimations since we eliminate regions where the number of individuals is very low.

Columns (1)-(4) in Table 2.9 estimate the relationship between the proximity to the most popular job of the peers in the region and the job finding rate when considering only 3 aggregate origins (African, European, Others). Columns (5)-(8) consider instead regions having a proportion of immigrants above the average. Estimates in Columns (1)-(2) reveal a decreasing relationship between the proximity to the most popular job of the peers in the region and the job finding rate. This result holds whether we consider recently arrived or recently hired immigrants. Same conclusions apply when focusing on the skilled population (columns (3)-(4)). Again, results remain robust if we do not include year fixed effects (Table 2.8). These results are coherent with conclusions drawn from Table 2.3 and the precision of our estimations is improved (*i.e.* standard errors are reduced) with respect to Table 2.7.

Table 2.7 – Proximity of a the individual from origin o to the most popular job among the peers in the region.

	Dependent variable: Proximity between the job of the immigrant and the most popular job among the peers in the region			
	Panel A: all immigrants		Panel B: skilled immigrants	
	Recent Immigrants	Immigrants seniority< 3	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)
Job finding rate	-2.036***	-2.163***	-4.740*	-3.676***
	(0.616)	(0.378)	(2.431)	(0.631)
Job finding rate^2				
Fixed Effects				
Origin	YES	YES	YES	YES
Year	YES	YES	YES	YES
Job	YES	YES	YES	YES
Origin*Year	YES	YES	YES	YES
Origin*Job	YES	YES	YES	YES
Job*Year	YES	YES	YES	YES
Individual Controls (age, age2, married, female, education)	YES	YES	YES	YES
Observations	1,153	4,307	593	1,890
R-squared	0.865	0.678	0.963	0.808

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: estimates from linear regression models, with robust standard errors clustered at the region-year level. Weights equal standard individual weights provided by the French Labor Force Survey. Individual characteristics include age, age^2, marriage, gender and education level. Origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. Significance levels are $***(p < 0.01)$, $**(p < 0.05)$ and $*(p < 0.1)$.

Columns (5)-(8) in Table 2.9 consider instead regions having a proportion of immigrants above the average (*i.e.* immigrant-abundant regions). In line with findings in Table 2.3 and with findings in columns (1)-(4) the relationship between proximity to the most popular job of the peers in the region and the job finding rate is decreasing whether we focus on immigrants with less than 3 years of seniority or on recently arrived immigrant. Nothing changes when considering skilled immigrants.

Results presented in Tables 2.7 and 2.9 with the indicator of the network matching rate based on indirect ties tend to confirm main findings of Table 2.3 and Figures 2.4, 2.5 obtained with the standard network matching rate indicator. For both recently hired immigrants with less than 3 years of seniority in the job and for recently arrived immigrants we find that the relationship between the network matching rate, *i.e.* proximity to the most popular job of the peers in the

Table 2.8 – Proximity of a the individual from origin o to the most popular job among the peers in the region. No year fixed effects.

	Dependent variable: Proximity between the job of the immigrant and the most popular job among the peers in the region			
	Panel A: all immigrants		Panel B: skilled immigrants	
	Recent Immigrants	Immigrants seniority< 3	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)
Job finding rate	-1.023**	-1.934***	-2.953***	-2.646***
	(0.485)	(0.277)	(0.738)	(0.405)
Job finding rate^2				
Fixed Effects				
Origin	YES	YES	YES	YES
Year	NO	NO	NO	NO
Job	YES	YES	YES	YES
Origin*Year	NO	NO	NO	NO
Origin*Job	YES	YES	YES	YES
Job*Year	NO	NO	NO	NO
Individual Controls (age, age2, married, female, educ)	YES	YES	YES	YES
Observations	1,153	4,307	593	1,890
R-squared	0.696	0.536	0.783	0.600

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: estimates from linear regression models, with robust standard errors clustered at the region-year level. Weights equal standard individual weights provided by the French Labor Force Survey. Individual characteristics include age, age^2, marriage, gender and education level. Origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. Significance levels are $***(p < 0.01)$, $**(p < 0.05)$ and $*(p < 0.1)$.

region, and the job finding rate is decreasing. Results hold when considering 3 aggregate origins or immigrant-abundant regions having a proportion of immigrants above the average.

6. Discussion and concluding remarks

Referrals play a major and an increasing role in recruiting policies of big companies. The efficiency of the network matching rate is though likely to be modified along the economic cycle, since the labor market tension tends to increase during expansions and decrease during recessions. In this paper, we analyze the correlation between the network matching rate and the job finding rate, which stands for our an indicator of market conditions.

Table 2.9 – Proximity of a the individual from origin o to the most popular job among the peers in the region. 3 aggregate origins (African, European, Others) and regions having a proportion of immigrants above the average.

	Dependent variable Proximity between the job of the immigrant and the most popular job among the peers in the region							
	Panel A: 3 aggregate origins (African, European, Others)				Panel B: immigrant-abundant regions			
	All immigrants		Skilled immigrants		All immigrants		Skilled immigrants	
	Recent Immigrants	Immigrants seniority< 3	Recent Immigrants	Immigrants seniority< 3	Recent Immigrants	Immigrants seniority< 3	Recent Immigrants	Immigrants seniority< 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Job finding rate	-1.542***	-2.142***	-2.357***	-2.878***	-1.605*	-2.205***	-5.613***	-3.944***
	(0.413)	(0.302)	(0.711)	(0.418)	(0.892)	(0.625)	(1.991)	(0.728)
Job finding rate^2								
Fixed Effects								
Origin	YES	YES	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES	YES	YES
Job	YES	YES	YES	YES	YES	YES	YES	YES
Origin*Year	YES	YES	YES	YES	YES	YES	YES	YES
Origin*Job	YES	YES	YES	YES	YES	YES	YES	YES
Job*Year	YES	YES	YES	YES	YES	YES	YES	YES
Individual Controls (age, age2, married, female, education)	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,382	5,234	692	2,325	835	2,885	439	1,326
R-squared	0.765	0.627	0.909	0.743	0.928	0.783	0.898	0.745

Source: authors' calculations, data from Labor Force surveys 2003-2012.

Note: estimates from linear regression models, with robust standard errors clustered at the region-year level. Weights equal standard individual weights provided by the French Labor Force Survey. Individual characteristics include age, age^2, marriage, gender and education level. For columns (1)-(4) origin fixed effects correspond to Africans, Europeans and Others. For columns (5)-(8) origin fixed effects correspond to North Africans, Africans, Turkish, South-East-Asians, South-Europeans, North Europeans, East Europeans, South-Americans and North-Americans. Significance levels are $***(p < 0.01)$, $**(p < 0.05)$ and $*(p < 0.1)$.

The first network matching indicator presented in this paper exclusively focuses on matches taking place through direct recommendations coming from network members. The second indicator exploits a positive externality dimension related to indirect ties. While the two indicators of the network matching rate capture different dimensions of the network effect, they both provide consistent results. For the observed values of the job finding rate, the relationship between the network matching rate and the job finding rate is decreasing when considering the whole population of immigrants and for recently hired immigrants. These findings are consistent with our theoretical setup.

The set of our estimations must though be interpreted with caution for several reasons that had been already underlined by the literature (see Goel and Lang, 2019). First of all, our measure of use of network remains imperfect. In the LFS individuals are asked if they found the job through friends, relatives or former colleagues. When the individual provides a positive answer we assume that the individual has benefitted from a direct recommendation from the tie. This may not be the case. As remarked by Goel and Lang (2019) if a friend, relative or former colleague tells the

individual about a job opening, the individual applies and gets the job, the individual is likely to report that the job was obtained through a friend, relative or former colleague, while there has not been a direct recommendation.

Second, in our empirical estimations, we cannot tease out whether employers rely more on referrals during certain economic conditions or whether job applicants are more likely to seek out referrals during those times. As most of the literature, our data only contains information on the employees' side (no employers' data). Moreover, the only useful information we have on networks is whether the individual has found the job through friends, relatives or former colleagues. It is thus not possible to disentangle if the progression of the network matching rate along the economic cycle is driven by the employer side or the employee side.

Third, social norms associated with some geographical origins may dictate that new immigrants (or those recently entering the labor market) may work for a close friend or relative. In this case it could be possible that our estimated coefficient on the job finding rate may be partially capturing this social norm, rather than an economic cycle effect. Note though, that our estimations include origin fixed effects that are going to capture systematic differences in the network matching rate across origins. These systematic differences could come from different social norms across origins, differences in the network size implying differences in the access to job offers across origins or differential discrimination attitudes towards different origins by natives.

Fourth, related with the previous point and as remarked by Goel and Lang (2019), individuals coming from origins with large social networks in France may endogenously reduce their search effort through formal channels, increasing their probability of finding a job through social networks. We do not consider this point as problematic, since we precisely seek to identify the use of these networks along the economic cycle. Moreover, origin fixed effects allow to control for systematic differences in the use of social networks across origins.

Finally, a major limitation of our second indicator is that, due to data limitations it is defined at the regional level so as to ensure a sufficient number of observations per origin. Because regions are quite large there may be strong heterogeneities from one place to another among immigrants from the same origin living in the same region. As they stand, our main result according to which the matching efficiency of job contact networks is countercyclical among immigrants has to be interpreted with perspective and taking into account the above limitations. More detailed data would be needed to further investigate the robustness of our estimation result, in particular concerning the geographic dimension.

Our findings have important implications on the labor market outcomes of immigrants. As discussed in Schmutte (2016) social networks contribute to the efficiency of the labor markets. Social networks are helpful for employers to find better workers and for workers to find better jobs. When economic conditions are poor, our results suggest that the role of social networks is higher. As a consequence, better matches can be expected between workers and firms so that immigrants would end up with better wages and lower probability of unemployment. For future research, we plan to investigate the medium and long-term consequences of the role of social networks on both duration in current job, job quality and wages. Longitudinal data tracking immigrants over time along with information on how they have found their job will be necessary.

Chapter 3

Occupational mismatch and network effects : evidence from France

1. Introduction

In recent years, the integration of immigrants into host societies, particularly in Europe, has received increasing attention in public debates. The integration of immigrants can be characterized not only socially but also economically. Economic integration of individuals is observed from the economic performance of immigrants in the labor market. The process of integration of immigrants in host societies is determined by individual, social, residential and economic factors [1].

Over the past decades, the labor market performance of immigrants and their descendants has been analyzed to understand what factors influence - or not - the process of integration into the labor market (Borjas, 1988, Borjas and Bronars, 1991, Dustmann and Fabbri, 2003), Zenou, 2015. From the point of view of host country governments, integrating immigrants into the labor market maximizes the use of the educational skills available in the country [2].

Indeed, education costs represent a significant share of GDP. In France, education spending accounts for nearly 7% of GDP (INSEE, 2017). From an economic point of view, a perfect match between the workers and the jobs in terms of education means that there is a return on investment of all the expenditure relating to education. This return on investment is primordial for economic immigrants.

The analysis of the integration of immigrants into the labor market has been supplemented by the analysis of the social networks. Since the work of Granovetter (1974), economists have highlighted the importance of the information transmission of information in the labor market in the performance of individuals in this market. Social networks can be considered according to different prisms. Indiviuals can be influenced by their residential environment, neighborhood on the one hand (Bisin and Verdier, 2001) as well as by peers and proximity in terms of cultural characteristics on the other hand (Granovetter, 1974; Jackson, 2010).

In this paper, we investigate the role of network effects on the probability of being overeducated or undereducated. This involves taking into account a measure of occupational mismatch situations in order to identify situations of overeducation, undereducation and perfectly matched situations.

1. Factors influencing the integration of immigrants are relative to the origin country, Europeans VS non-Europeans (Bisin et al., 2011); the place of residence (Kain, 1968; Edin et al., 2003) ; occupational choices of immigrants and their descendants (Constant and Zimmermann, 2003) and social relations (Munshi, 2003; Patel and Vella, 2013a)

2. Australia, Canada, USA practice a selection of immigrants according to their educational level (Cobb-Clark, 2004). The justification for these recruitments is based on the fact that the higher the educational level, the better the employability. The aim is to have a higher potential for productive capacity in the economy (Cobb-Clark, 2004).

Furthermore, we also need to identify in which cases individuals mobilize their network to find a job. We seek to analyze to which extent social relations affect the occupational choice of immigrants in France and the probability of being overeducated, undereducated ?

The probability of being in an occupational mismatch situation can influence the project of migration of individuals. In fact, cases of overeducation can characterize a situation where immigrants have difficulties of integration in the host society or in the host labor market. These difficulties of integration can generate economic performances lower to those expected initially. On the other hand, undereducation cases can characterize situations where the immigrant has been able to integrate easily into the labor market. It could be explained by the human capital of immigrants who are able to put forward their skills to find a job in which they do not have the required level of education. The role of the social networks may be decisive in this process. We contribute to the literature on this topic by proposing a general analysis on occupational mismatch (overeducation and undereducation) for immigrants in France. We do not focus on one origin but on two origins, North-Africans and South-Europeans [3]. The second contribution of this paper is related to the role of network effects (peers and residential effects) on occupational mismatch.

The next section presents the existing literature on occupational mismatch as well as on network effects. In section 3, we present the database and some descriptive statistics about migration in France, the role of social networks and the occupational mismatch situations. We explain how we define both the network effect and the occupational mismatch situations. In section 4, we describe the econometric specifications and the strategy employed to identify the role of the social relations on the probability of being overeducated or undereducated. Section 5 presents our results. Finally, Section 6 conclude.

2. Literature review on occupational mismatch

2.1 Definition and measurement

Occupational mismatch situations are characterized by a notion of imbalance between the educational level of individuals and the educational level required for a job (Rumberger, 1981; Sparreboom and Tarvid, 2016; McGuinness et al., 2017). The notion of imbalance applies for these cases

3. The choice of these two origins is motivated by the migratory history of these two groups in France. Due to their relatively long presence, these two groups of origins have experienced different integration processes. We therefore hypothesize that the location choices resulting from these distinct integration processes characterize a different influence of the residential environment according to origins. We discuss this choice in section 3.1

to the labor market and more specifically to the occupational choice of workers. The interest of this literature is to be able to characterize the quality of matching between the skills and educational level required for a job and those of the workers.

The term *mismatch* has been introduced into the literature by Kain (1968). The aim of his concept was to understand the residential segregation. Kain (1968) hypothesizes that there is an imbalance in U.S. cities between the places of residence of individuals and the location of jobs within cities. The disconnection between place of residence and job location would be a contributing factor in explaining the difficulties of access to jobs for workers who are least well connected to employment areas. His hypothesis, in a general way, makes it possible to highlight a characteristic discriminating some groups of individuals (according to their origin, their place of residence, l'Horty et al., 2011). Applied to occupational choice, the occupational mismatch characterizes this notion of imbalance in relation to education.

The literature has highlighted two types of occupational mismatches: vertical and hoizontal mismatch situations. The vertical mismatch situations focus on the educational level of workers and the educational level required for the job (by educational level, we consider the years of education). This mismatch consists in comparing these two levels of education. If the educational level of workers is higher or lower than the educational level required or observed for the job, we consider that there is an occupational mismatch situation. The workers is overeducated if the individual educational level is higher than the educational level required/observed for the job. Conversely, if the individual educational level is lower than the educational level required/observed for the job, the individual is undereducated.

The horizontal mismatch situations focus on the imbalance of skills. There is a mismatch between the skills required for the job and the graduates specific field of education. Three categories are used to characterize the quality of a match: a good match, a weak match or a mismatch (Nordin et al., 2010).

There are different methodologies for capturing information about the educational levels of individuals and jobs. The two methods used are either *subjective* or *objective*.

The *subjective* approach is based on the statements of individuals. With an interview, a questionnaire, the occupational mismatch is determined thanks to the feeling of individuals about the matching between their educational level and the educational level required for the job that they held. This approach is decomposed into two categories: *direct self-assessment* or *indirect self-assessment*. For the *direct self-assessment* method, workers are considered to be overeducated or

undereducated if they declare that their educational level is higher or lower than the educational level required for their job (Verhaest and Omey, 2006 ; Verhaest and Omey, 2009). For the *indirect self-assessment* method, workers are interviewed on the educational level required for the job. The researchers then compare the level of education of individuals to the level of education needed and stated by the respondents. This method is based on the opinion of workers. The use of this method involves limitations on the collection and analysis of data. First, Sloane (2003) show that workers can inflate their position within the firm. This subjectivity is confirmed by the work of Maltarich et al. (2011) with the perception bias. The bias can be caused by a comparison with workers in similar positions. Finally, the criteria required for jobs may be different depending on the individuals interviewed in the same job (McGuinness, 2006). However, despite these different limitations, the main advantage of this approach is the direct questioning of each worker on the job requirements (level of education, specific tasks)(Sala, 2011).

The *objective* approaches are based on a statistical method (realized matched method) or a normative method (job analysis method). The job analysis method uses the International Standard Classification of Education to characterize the occupational mismatch situations (Baert et al., 2013 ; McGuinness et al., 2017). Thanks to this classification,for each job is defined an educational level required. The vertical mismatch is identified by comparing the level of education of individuals with the level of education required for the job held. Three situations are identified through this method: overeducation if the individual has a higher level of education than the one required for the job, perfectly matched if the educational level of the individual match which the one required for the job and undereducated if the educational level of the individual is lower than the one required for the job. This method makes it possible to have an objective measure of the vertical mismatch and avoids to capture the subjectivity of the individuals. However, the main limitation of this method lies in the classification and title of jobs held by individuals. In fact, the same job, but in different firms, can acquire different tasks and skills. This method prevents capturing this heterogeneity because of its static approach based on the classification system (McGuinness, 2006).

The second *objective* approach is the realized matched method. Thanks to the educational distribution for each job, we calculate the average educational level and the standard deviation. To characterize the occupational mismatch, it is necessary to compare the level of education of individuals with the average level of education observed for the employment held. If the individual's education level is higher than the observed average educational level plus the standard deviation, the individual is considered overeducated. Conversely, if the individual's educational level is lower than

the average educational level observed in employment minus the standard deviation, the individual is identified as undereducated. Finally, if the educational level of the individual is between the average educational level observed more or less the standard deviation, the individual is perfectly matched (Verdugo and Verdugo, 1989 ; Bauer, 2002). The advantage of this method is that it can be applied to very large samples (unlike methods based on individual interviews). In addition, this method also applies to the situations where it is not possible to use the occupational classification. (Leuven and Oosterbeek, 2011).

However, this method does not make it possible to control overrepresentation of over-graduated or under-graduated individuals in a job. Indeed, if a job is mainly composed of workers with a level of education significantly different from the level of education traditionally required, this characteristic can not be taken into account and will even be integrated in the identification of occupational mismatch situations. However, this limit is to be qualified and must be put in perspective with *the inflation of diplomas*. In fact, the occupation of a job by overqualified workers can be generalized and therefore not felt by individuals because of the subjective value given to the diploma, which is a function of the workers' representation of the skills acquired both in a professional point of view than educational (Peugny, 2009).

An alternative for measuring the occupational mismatch with the statistical approach is to use the median rather than the average. The advantage of using the median is to capture the central measure of educational level rather than giving weight to individuals with extreme educational levels. Unlike the average, the median will not be sensitive to extreme values but will only take into account the rank of values according to their order. In addition, the limit relative to the median about the omission of extreme values allows us to have a more accurate measure of the level of education observed in the job. The interest of the determination of the occupational mismatch with a statistical approach is not to take into account the extreme values [4] in the calculation of the average level of education but to characterize a representative level of education in the jobs observed.

In addition to the vertical mismatch, the literature has also identified a mismatch based mainly on the skills of individuals. The measure of the horizontal mismatch is characterized by the skills of the diplomas of the individuals and the skills required in the jobs held by the individuals.

The methods used to capture this information are: the job-analysis method or the subjective

4. The extreme values characterizing the occupational mismatch situations, these do not have to be included in the calculation.

method. These two methods have the same advantages and disadvantages as measuring the vertical mismatch. The strategy for measuring the horizontal mismatch is identical to that of the vertical mismatch. In the case of the job analysis method, from the education codes specifying the field, the occupational mismatch is determined by comparing the educational field of the individual to the required one of the job held. In the case of the subjective method, individuals are asked about the link between their educational field and the required field (according to the workers) to perform the tasks in their job. Thanks to this approach, different degrees of mismatch can be determined: either the individuals have an educational field perfectly matching to the field of their employment (match), the individuals have a partial correspondence between their educational field and the field of their employment (partly mismatch) or individuals have an educational field that does not match to the required field in their job (mismatch) (Robst, 2007 ; McGuinness et al., 2017). It should be noted that this classification is based on the opinion of the workers and that this feeling, both in terms of the required fields and the valuation of their diploma is totally subjective.

2.2 Immigrants and occupational mismatch

The occupational mismatch is positioned in the literature on the integration of immigrants in the host country. The integration of immigrants depends directly on the portability of human capital. This means that professional or educational skills acquired in the country of origin are not valued identically between the country of origin and the host country. The value of human capital is depreciated when immigrants enter the host country's labor market. Chiswick and Miller (2009c) empirically check the transferability of human capital between home and host countries and show that the more immigrants acquire human capital (professional background), the greater the likelihood of being overeducated [5]. Their study shows that the low transferability of the human capital is linked both to diplomas obtained in the country of origin, but also to professional experience. The characteristic of immigrants lies in the fact that their human capital is acquired (at least partially) in the country of origin. A reason for non-transferability is related to the host language skills. If the immigrant is not fluent in the host country language, this can lead to a lower productivity of immigrants. In addition, education systems may differ between countries of origin and host countries. As a result, a degree obtained in the country of origin may be a bad signal in the host country labor market. Regarding professional backgrounds, Chiswick and Miller (2009b) focused on the influence of the length of work experience of immigrants in their country

5. Chiswick and Miller (2009c) use US data for their analysis.

of origin. Their results showed that the longer the length of work experience in the country of origin, the higher the probability of being overeducated. This result shows that the transferability of immigrants' human capital is not limited to educational characteristics alone but also takes into account professional experiences.

Beyond educational and professional characteristics, the duration of migration has a direct impact on the quality of jobs held by immigrants. Green et al. (2007) show that newcomers tend to be more overeducated than natives. Using Australian data, Green et al. (2007) highlight that although Australian immigration policy tends to be more selective in the selection criteria for immigrants (in terms of educational attainment), educational resources are not exploited because immigrants are more likely to be overeducated than natives. The authors point out that this result is stronger for non-English-speaking immigrants. Individual characteristics in linguistic but also physical terms influence the quality of jobs (Lindley (2006) using UK data). Lindley (2006) have shown that non-White individuals tend to be more overeducated than natives.

Occupational mismatch situations tend to decrease as the duration of migration increases (Poot and Stillman (2010) using New Zealand data and Cim et al. (2020) using European data [6]). The longer the migration period, the more human capital immigrants acquire in the host country. This acquisition of human capital can be characterised by the enhancement of professional skills and diplomas obtained in the host country.

However, the literature has highlithed the fact that the integration process of immigrants is not homogeneous among individual characteristics (see Price (2001) or Dustmann and Fabbri (2005) [7]). The gaps (wages, employment) between immigrants and natives do not disappear for some origins over time (Ingwersen and Thomsen, 2019). Using German data, Ingwersen and Thomsen (2019) points out that foreign diploma increases the wage-gap by 4.5%. Aldashev et al. (2012) show that the wage gap between foreigners and natives is equal to 25%, using German data. For France, the siutation is similar (Algan et al., 2010). Algan et al., 2010 find that being from Africa contributes to lowering workers' wages. The persistence of the wage differential between immigrants and natives on the one hand and between the different origin groups on the other hand differs according to the group to which the immigrants belong. This wage differential, which characterises difficulties in integrating immigrants into the labor market, may persist between generations of immigrants

6. Cim et al. (2020) analyze occupational mismatch situations of immigrants in Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden, UK

7. Using the Labor Force Survey of the United Kingdom, these two analyses show that white immigrants tend to be less overeducated than non-whites.

(Algan et al., 2010).

2.3 Role of social relations on the occupational mismatch

This paper is related to the literature on immigration and the role of the referrals. Using US data, the seminal work of Montgomery (1991) finds that referrals decrease the asymmetric information problem between firms and workers. Montgomery (1991) points out that individuals with similar characteristics can have very different economic performances depending on whether or not they find a job through a referral. Referrals help individuals to find a job and influence directly the occupational choice of workers. Moreover, when a referral suggests a worker, the referral has its reputation committed towards the firm and thus makes its best to ensure a good quality of the referred individual and the firm. Furthermore, referrals allow to reduce the recruitment costs of new workers for firms.

In addition, the literature on social networks has highlighted the concept of homophily, characterized by individuals' preferences to interact with people with similar characteristics (Calvo-Armengol and Jackson, 2004a; Calvó-Armengol and Jackson, 2007b). Applied to labor market and immigration, homophily characterizes the transmission of job opportunities between individuals belonging to the same group of origin. Dustmann et al. (2015) find that the probability of finding a job for an immigrant increases with the share of immigrants from the same origin in the firm [8]. These results characterize the positive role of the referral on the integration of immigrants into the labor market.

However, finding a job through a referral can contribute negatively to the integration of immigrants. Addison and Portugal (2002) (using Australian data) or Bentolila et al. (2010) [9] highlight the negative role of referral on immigrant wages. These studies do not take into account the occupational choice directly, but distinguish immigrants according to their job-search method and the way used to be hired. As a result, the fact that an immigrant who finds a job through a referral has a lower wage than other immigrants (not having found a job thanks to a referral) can be explained

8. Using German data, Dustmann et al. (2015) test a referral-based job search networks where employees transmits the information to the firm about new hires. They use three different databases allow them to capture information about the educational and professional backgrounds. Thanks to the survey, link to the first database, they have direct information on referrals.

9. They use American and European data. The European countries database contains 13 countries: Austria, Belgium, Denmark, Finland, France, Greece, the Netherlands, Luxembourg, Ireland, Italy, Portugal, Spain and the United Kingdom.

in particular by an occupational mismatch between the educational level of the workers and the one required for the job. In this situation, the process of integration of immigrants is affected by the role of referral even though the latter, and this is what the papers cited above specify, has a positive role in reducing the duration of unemployment.

Thanks to a theoretical model, Horváth (2014) studies the relationship between the labor market and the interactions between individuals according to their characteristics. More specifically, Horváth (2014) analyzes the relationship between the role of social networks on the transmission of job opportunities and occupational mismatch situations. Horváth (2014) points out that the higher the degree of homophily, i.e. the more agents with similar characteristics are connected, the lower the percentage of mismath. He shows that job search via referrals can be more efficient than the formal job search method.

In addition to these theoretical and empirical studies, the literature has also highlighted the fact that immigrants are more likely to find a job through referral than natives (see Lazear, 1999 ; Aslund et al., 2014). Sharing a common language between individuals reduces the cost of finding a job. Indeed, networks between groups of individuals of the same origin allow both established immigrants and newcomers to share information on the characteristics of the labor market in the host country. Beyond the influence of language on the job search method, language and more generally human capital influence occupational choice. For immigrants, the question of human capital and more specifically the transferability of human capital influences the occupational choices as well as the probability of being in an occupational mismatch situation (Chiswick and Miller, 2009a; Chiswick and Miller, 2010; Aleksynska and Tritah, 2013). Compared to natives, foreign-born workers have a lower transferability of human capital. This induces both lower labor market performances (wages) but also situations where immigrants are more overeducated than natives.

In this paper, we focus on the occupational mismatch and network effects for immigrants. Social networks of immigrants depend on many factors: link with the country of origin, link with the host country, willingness to integrate, residential environment, etc. All of these relationships may have an impact on the integration of immigrants into the labor market. However, immigrants are characterized by a very high heterogeneity because of their migration path, the mother tongue, the age of arrival in the host country, etc. All of these characteristics have either a positive or negative impact on the integration of immigrants into the host country labor market. The integration of immigrants into the labor market through the mobilization of their network has been analyzed in Chort (2017) and Kalfa and Piracha (2018).

Chort (2017) is interested in a single immigrant population (Senegalese) with 4 countries of destination (France, Italy, Mauritania and Ivory Coast). One of the characteristics of her approach lies in the decomposition of the occupational mismatch. Indeed, two forms of occupational mismatch are identified: horizontal and vertical. The occupational mismatch is determined from the statements of immigrants. Regarding econometric estimates, Chort (2017) estimates a bivariate Probit model. This estimation method makes it possible to estimate the variable relating to social networks with an instrument [10]. Indeed, the author points out that the Senegalese population is composed of different ethnic groups. This method allows the author to capture these ethnic characteristics by indirectly integrating them into the estimation of the occupational mismatch via the network variable. Results show that the mobilization of the network allows Senegalese to reduce the probability of being in a situation of vertical mismatch. However, using an immigrant referral to find a job increases the probability of being in a horizontal mismatch situation.

Kalfa and Piracha (2018) also studied the link between occupational mismatch and social relations. However, their study differs because of the country of study (Australia), the studied population (native and immigrant) and the occupational mismatch (overeducation is only considered, underedcated situations are omitted). Regarding the identification of social relations, the authors rely on a Principal Component Analysis to build a social capital index. Finally, the authors are interested in the dynamics of overeducation. The authors integrate the situation of overeducation of workers during the previous period in the estimation of overeducation. The results show that there is a state dependence (vs persistence) to be overeducated with a larger coefficient for immigrants than natives. Moreover, the social capital increases the probability of being overeducated.

The contribution of our article is twofold. On the one hand, we analyze the contribution of network effects to the probability of being in an occupational mismatch situation from the French Labor Force Survey. In addition, we incorporate characteristics relating to the residential and social environment of individuals in order to capture the role of the neighborhood effect as a determinant of occupational mismatch [11]. Secondly, we do not focus only on overeducation but we

10. Chort (2017) endogenizes the variable *Job finding through a referral*. It justifies this choice by the past migration of Senegalese as well as the composition of the Senegalese population. Senegal is composed of several ethnic groups including *Wolof*. This group is *the largest ethnic group in Senegal*. However, Chort (2017) pointed out that the Wolof have recent immigration compared to other Senegalese ethnic groups. The hypothesis made by Chort (2017) is that, according to the ethnic group of Senegalese, individuals do not have access to the same network in host countries. Finally, the author points out that this instrument helps to explain the use of a referral to find a job but has no causal effect on the variable relating to the occupational mismatch.

11. We measure the share of immigrants as well as the unemployment rate for each urban area.

also introduce undereducation in our estimates. The interest of taking into account overeducation and undereducation is to be able to capture the potential heterogeneity between each origin. Indeed, the socioeconomic profiles are different for each group of immigrants. Taking into account all the mistmatch situations makes it possible to better understand the process of integration into the labor market of each origin, i.e.the mobilization of referral to find a job, the influence of the neighborhood on finding a job through a referral and being in an occupational mismatch situation, and the role of referral on probability of being in an occupational mismatch situations.

3. Data and descriptive statistics

3.1 French labor force survey

We use the French Labor Force Survey (LFS) for our empirical analysis. This database is conducted by the National Institute of Statistics and Economic Studies [12]. The main purpose of this database is to measure the unemployment rate as defined by the International Labor Organization (ILO). When this database was created in 1950, once a year, all the individuals were interviewed. Since 2003, information has been collected for a total of 18 months for each individual. Indeed, each individual is interviewed six times every three months. The first and the last interrogations are face-to-face while the intermediate interrogations are mainly by phone call. In 2009, the sample was increased by 50%. From 2005 to 2012, the sample increased from 37,000 to 57,000 households surveyed per quarter.

One of the particularities of the LFS is the weighting associated with each individual. Using census data, a weight associated with each household is composed so as to ensure its representation in the French population. This weighting is based in particular on individual characteristics as well as the location of households.

The LFS is also characterized by a specific methodology regarding the location and selection of surveyed households. Indeed, households are not isolated geographically when they incorporate a wave of interrogation. The whole territory is divided into an urban area. Each urban area is geographically limited to the same street, the same neighborhood. When an urban area is selected to integrate the LFS, 20 households living nearby are interviewed simultaneously. This feature will enable us to identify all households living nearby to characterize the neighborhood's economic and social environment. We will detail the capture of this information in the section on the definition

12. In French, Institut National de la Statistique et des Etudes Economiques abbreviated INSEE.

and description of data.

The period that we consider extends from 2005 to 2012. We can identify the origin of the immigrants according to 8 origins : North-Europeans, South-Europeans, East-Europeans, North-Africans, Sub-Saharan Africans, Turks, South-East Asians and Others [13]. However, for the estimates, we take into account all immigrants (without distintion of origin), North-Africans and South-Europeans.

The composition of the French immigrant population depends on its migration history. Generally speaking, Europe has been, throughout history, a territory where population flows have been characterized by inflows and outflows. This observation at the European level can also be applied to the situation in France. Since the post-war period, France has positioned itself more as a host country. During its recent past, France has experienced various waves of immigration. Immigrants arriving in France mainly come from two regions: Southern Europe and North Africa. Figure 3.1 characterizes the evolution of the proportion of immigrants in France according to their origin in relation to the foreign population in France [14]. We note that for these two origins, the stock of immigrants has experienced two periods during which the proportion of immigrants has increased.

More specifically, since 2008, inflows into France have increased by 4.4% over the period 2008-2013 [15]. The increase in these flows is characterised by a slight fluctuation in the composition of inflows. North Africans remain the most represented group of origin among immigrants entering France. Even if this proportion has slightly decreased during the 2008-2013 period, the proportion of immigrants from the Maghreb represents about 34% of inflows. Conversely, the proportion of South European immigrants among the inflows has fallen sharply since the post-war migration waves.

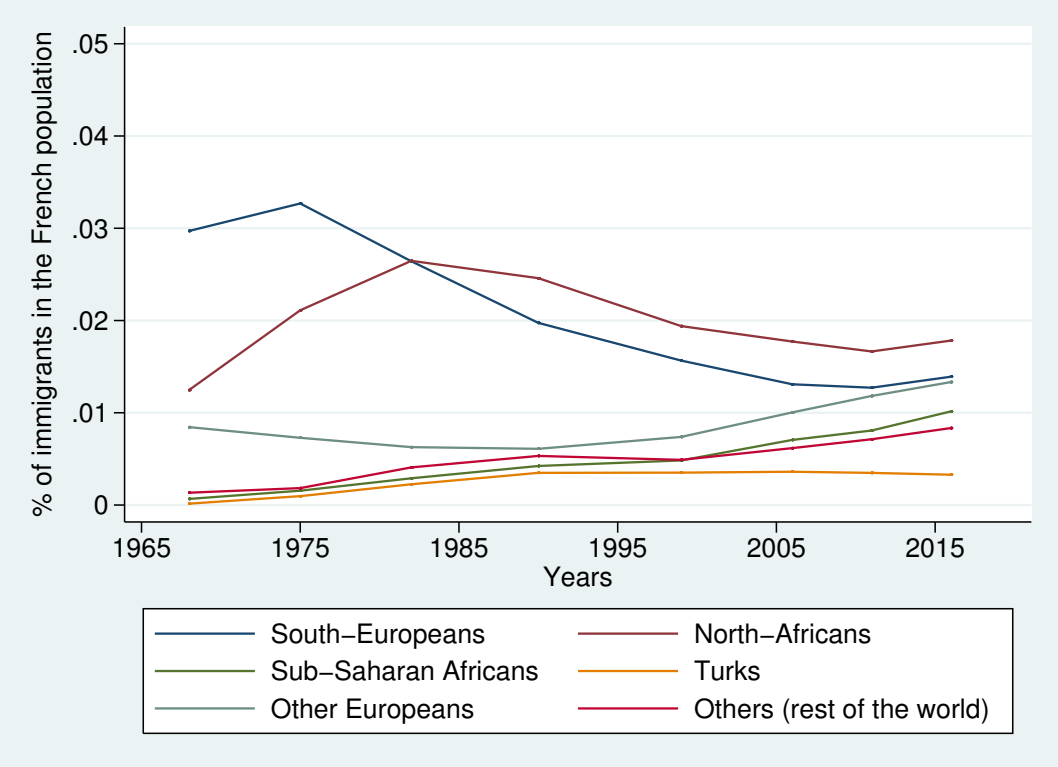
Several arguments justify the choice to focus on these two origins. The first argument concerns the similarities existing between these two origins concerning the migratory history of these origin groups in France. Indeed, these two groups are the only ones to have experienced significant

13. We create this group because of the few individuals for some origins (North-America, South-America, Oceania and the rest of the world)

14. The figure does not represent arrivals but the stock of individuals born abroad who have not acquired French nationality in relation to the foreign population, i.e. individuals born abroad. These data come from the census and illustrate the period 1968-2016. The data used do not allow us to know the origin of immigrants who have acquired French nationality. We have therefore chosen to remove these individuals from this representation.

15. This result is calculated from Mazuy et al. (2015). The number of entries in France is calculated on the basis of permits issued to foreign nationals. Residents of European Union countries are excluded from this sample due to the free movement of persons within the Schengen area.

Figure 3.1 – Stock of foreign-born individuals in France - 1968/2016



Source: data are computed from OECD (https://data.oecd.org/migration/foreign-born-population.htm).

waves of migration since the post-war period. These migratory waves are characterised both by temporary migration but also by a significant proportion of immigrants settling permanently in the host country. These permanent migrations are characterised by the structuring of social networks within the host countries but also by the building of bridges between the host country and the country of origin. These network structures enable new arrivals to benefit from support upon arrival in the host country. This support is characterised by both residential and employment assistance.

The second argument justifying the choice of these two origins for econometric estimates is based on the different trajectories of these two groups since the post-war period. This is characterized by a heterogeneity in the geographical concentrations of immigrant groups (Brutel, 2016). European immigrants are less spatially concentrated than North African immigrants. According to Brutel (2016), the geographical distribution of European immigrants is similar to the choice of location of the natives [16].

These differences in the choice of location according to origin are characterized in particular by the increasing mobility of immigrants in France. Solignac (2018) noted that the rate of mobility of immigrants is higher than that of natives. Associated with the paper of Fromentin (2019), This mobility of immigrants has been characterized by two opposing trends according to origin since 1960. The first trend characterizes a strengthening of the presence of immigrants in major urban centres. This type of profile corresponds in particular to the location choices of North-Africans. Since 1990, the mobility of immigrants has also been characterised by mobility towards rural areas. Without reaching the distribution of natives according to urban or rural areas, immigrants tend to spread out over the territory without favouring large urban areas. This mobility trend characterises the locational choices of European immigrants.

These two arguments characterizing at the same time common points, in particular concerning the seniority of the first migratory waves but also different trajectories in terms of integration process make that differences can exist concerning the influence of the residential environment on the occupational mismatch.

About the educational level, we define the education as the number of years of education. The database gives information about the highest diploma obtained by individuals. From this

16. When we indicate that the distribution of European immigrants is similar to that of the natives, it means that European immigrants have similar locational choices to the natives in terms of the degree of urbanization. Unlike other origins (North-Africans for instance) where the degree of urbanization is higher than the natives, European immigrants have invested in cities as well as rural areas in a similar way as the natives.

information, we converted this diploma in years of education in order to be able to treat the education as an ordered variable [17]. Then, we determine the origin of the diploma thanks to the last diploma obtained by the individuals. The origin of the diploma is not given in the database. However, the LFS gives us information about the year of last graduation of immigrants. Crossed with the year of arrival in France, we can distinguish immigrants according to the country of last graduation (France or abroad). However, this information has several limitations. The first relates to data collection. The data collected are declarative and may be inexact (non-French-speaking immigrants may have difficulty understanding the question). Second, we do not know the immigrant's educational background. We use only the last diploma obtained as information to determine the origin of the diploma. This means that an immigrant can be considered as having graduated in France with an educational path completed mainly in the country of origin.

3.2 Composition and characteristics of the immigration in France

Table 3.1 – Composition and educational characteristics of immigrants in France, 2005-2012

	Foreign diploma		French Diploma		
	%	Average educational level	%	Average educational level	Share of immigrants
North-Europeans	49,98	13,1	50,02	13,3	8,68
South-Europeans	17,91	13,1	82,09	11,9	17,16
East-Europeans	61,99	13,2	38,01	14,4	5,42
North-Africans	23,6	12,6	76,4	13,2	35,16
Sub-Saharan Africans	33,03	12,6	66,97	13,5	15,51
Turks	43,36	12,3	56,64	12,4	3,26
South-East Asians	13,95	12,9	86,05	13,4	3,38
Others	45,37	13,8	54,63	14,4	11,43
All immigrants	33,5	13	66,5	13,2	12

Source: authors' calculations, data from French LFS 2005-2012.
North-Europeans: Germany, Belgium, Netherlands, Luxembourg, United-Kingdom, Switzerland, Austria, Norway, Sweden; South-Europeans: Italy, Greece, Spain, Portugal; East-Europeans: Poland, Yugoslavia, Other European countries; North-Africans: Algeria, Tunisia, Morocco; Sub-Saharan Africans: Other African countries; Turkey ; South-East Asians: Vietnam, Cambodia, Laos; Others: Rest of the World.

17. We calculate the years of education from the age of compulsory education. In France, before 2019, the age of compulsory education was 6 years old. From this age, we have calculated the number of years needed to reach each of the diplomas (following a classical schooling path).

Table 3.1 presents the composition of immigration in France over the period 2005-2012 [18]. The immigrant population represents 12% of the total population in France. The main groups are North Africans and South Europeans. These groups are characterized by a relatively old migration time. During the 20th century, France experienced many waves of immigrants from these two regions (Brutel, 2014). However, since the beginning of the 2000s, new population flows have emerged from Eastern European countries as well as Sub-Saharan African countries. Beyond this composition of immigration in France, it is interesting to note that the educational characteristics are heterogeneous depending on the origin of immigrants.

Indeed, the origin groups with a percentage of individuals having a French diploma exceeding 75% are South-Europeans and North-Africans. These results can be explained in particular by past migration [19]. However, only one origin has more graduated from the country of origin than from the destination country: East Europeans. These results may characterize a migration based on the hypothesis of a positive self-selection of immigrants. Indeed, Chiquiar and Hanson (2002) showed that there is a negative relation between migration and education. The fact that the East-Europeans mostly obtain their diploma in the country of origin is due to the fact that they use their diploma as a mean to immigrate.

According to the origin of the diploma, the educational level is heterogeneous between individuals belonging to the same origin. Only South-Europeans who have been graduated in France have a lower average educational level than South-Europeans graduating from the country of origin. For other origins, all immigrants who graduated in France have on average a higher educational level than peers graduated in the country of origin.

This heterogeneity relative to the composition of immigration in France (linked with the French migratory history and the successive waves of population) and the education of immigrants may suggest heterogeneous labor market performances depending on the origin of the individuals.

3.3 Definition of the occupational mismatch

One of the key points of the analysis is to identify situations where there is an occupational mismatch. For that, we use the realized matched method due to data availability (Verdugo and

18. We use the weighted sample

19. Immigrants from North Africa and Southern Europe have migrated massively since the end of the Second World War. These migration waves are characterized by a shift from temporary to permanent migration. Migrants who have remained in France have structured themselves into networks that enable newcomers to benefit from support upon arrival.

Verdugo, 1989; Chiswick and Miller, 2010). This method requires calculating the average educational level for each job and comparing the average educational level required for each job to the educational level of individuals. If the individual has an educational level higher (or lower) than the educational level required for the job, there is an occupational mismatch situation (Verdugo and Verdugo, 1989; Bauer, 2002).

First, we calculate the median educational level for each job and the standard deviation. To do this, we use a sample composed of natives only. We hypothesize that the integration of immigrants can introduce a source of bias into the calculation of the variable. Using this variable, we then compare the median educational level obtained for each job with the educational level of each immigrant according to the job held. From these elements, three possible situations arise. If the individual's education level is between the median educational level of the job plus or minus the standard deviation, then the individual is considered perfectly matched. If the educational level of the individual is higher than the median educational level of the job held plus the standard deviation, the individual is in a situation of overeducation. Finally, if the individual's educational level is lower than the median educational level of employment minus the standard deviation, the individual is undereducated [20].

3.4 Definition of the network

A fundamental point of the analysis refers to the network effect. Our main social network variable allows us to identify people who have used a referral to find a job. In the database, individuals in employment are interviewed with the following question: "*How did you find your job in this company?*". The answer to this question allowing us to identify individuals who have found employment through a referral is: *By family or personal relations*. Thanks to this variable, we distinguish individuals according to the case when they found a job thanks to a referral of other cases otherwise. However, there are two things to note about using this variable. First, this variable is declarative. As a result, there may be limits to the collection of this information, particularly with regard to immigrants and potential misunderstandings due to approximate language proficiency. The second point to emphasize about this variable is related to the information of the referral. Indeed, we do not distinguish the origin of referrals or even the relationship between the interviewee and the referral (family, peers ...).

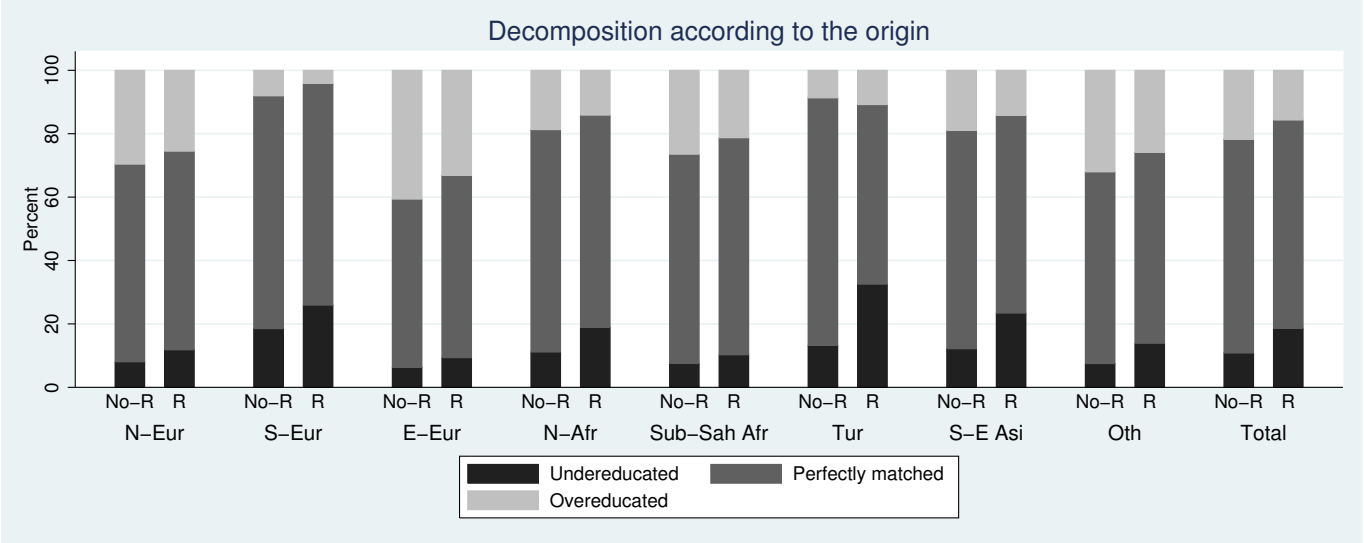
20. 13 841 immigrants are perfectly matched, 8 493 immigrants are undereducated and 5 633 immigrants are overeducated.

To overcome these limitations, we propose two variables to characterize the residential environment of individuals. The first variable concerns the share of immigrants living in the same urban area of the immigrant. LFS makes it possible to identify individuals living in the same area. As a result, we calculate the share of immigrants (without distinction of origin) living closely [21]. This variable is used to capture homophily. We define homophily as the tendency of individuals to interact with people who have the same characteristics. As the location choice of individuals may be constrained (difficulties of access to housing, low financial resources), the composition of the neighborhood may not be a motivation for the location choice. Therefore, if this concept of homophily is verified, it means that peers will help individuals to find a job for which they are qualified. The estimated parameter associated with the variable will be either negative for situations of overeducated individuals, or positive for situations of undereducated individuals [22]. The underlying idea is that the peer network (in the broad sense) allows immigrants to integrate more easily the labor market.

We also calculate the share of individuals being employed or not in the urban areas. From these elements, we calculate then the unemployment rate in the urban area. This information captures information about the economic environment. If the area's unemployment rate is high, we may suppose that the residential environment will have a role that is not significant in the job search, or the role of the residential environment will be negative and will not allow individuals to find a job. In the opposite case, if the unemployment rate is low, the estimated parameter should characterize a better integration of individuals in the labor market. In this case, the estimated parameter will be positive for undereducated situations or negative for overeducated situations.

These last two variables allow us to characterize both the social and economic environment of immigrants. The integration of these variables into the econometric model will be presented in a following section.

Figure 3.2 – Occupational mismatch and network effects - Decomposition according to the origin



Source: authors' calculations, data from French LFS 2005-2012.
No-R and *R* respectively mean that the job is found without referral and workers find a job through a referral

3.5 Description of the network effect and the occupational mismatch

Figure 3.2 presents the results characterizing the relation between the occupational mismatch and the network effect. The vertical axis indicates the share of individuals who are overeducated, undereducated or perfectly matched. On the horizontal axis, we have decomposed individuals according to different characteristics. First, we distinguished individuals according to their origin. For each origin, we also distinguished individuals according to their job search way. Two situations are identified: the first is for individuals who have found a job without referral ($No-R$), the second is for individuals who have found a job thanks to a referral (R).

First, we note that the share of occupational mismatch situations is not homogeneous according to the origin. The share of overeducated is very low for some origins (South-Europeans and Turks) but very high for East-Europeans. Indeed, the East-Europeans have a higher average educational

21. The numerator corresponds to the number of immigrants residing in the urban area while the denominator corresponds to the total number of individuals (natives and immigrants) residing in the urban area.

22. For overeducated situations, the negative sign of the estimated parameter means that finding a job through a referral decreases the probability of being overeducated. For undereducated situations, the positive sign means that finding a job through a referral increases the probability of being undereducated. We consider that if immigrants are undereducated, it means that they are able to compensate the lack of education normally required for the job with specific skills (professional background).

level than other origins, so the share of individuals likely to be overeducated is more important [23]. Individual factors can also help explain these differences. Indeed, the cultural and linguistic distance can influence the integration of immigrants in host countries. Regarding the share of undereducated individuals, the results are also heterogeneous. Some origins have a higher share of undereducated individuals than others. The results show that North-Europeans, East-Europeans, Sub-Saharan Africans have similar profiles regarding undereducation.

Concerning the role of referral, for each of the origins, we note that there is a gap between the shares of overeducated, undereducated and perfectly matched individuals. Individuals who have found a job through a referral are less overeducated than individuals who have found their jobs thanks to another way. This result applies for all origins (except Turks). This observation suggests that referrals could have a positive role in the integration of immigrants into the labor market. Indeed, referrals reduce the share of overeducated individuals and also increase the share of undereducated individuals. However, as previously stated, we have no information regarding the origin of the referrals. The purpose of our estimates will be both to determine the contribution of the referral to the probability of being in an occupational mismatch situation and also to specify the origin of the referral by incorporating features related to the residential (economic and social) environment.

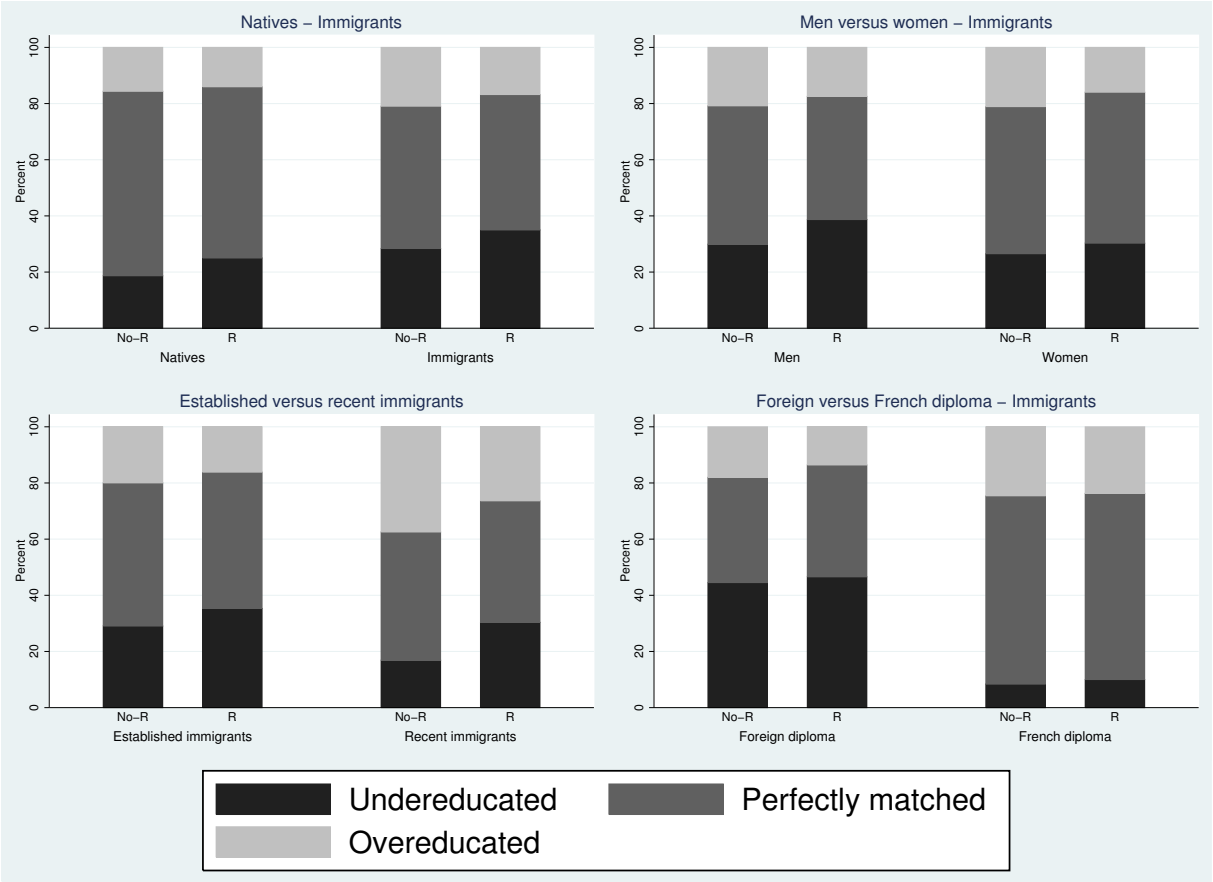
Figure 3.3 has the same specifications concerning the decomposition depending on the referrals. However, we decompose individuals not by origin but by individual characteristics. The first panel presents the results between natives and immigrants. We note that referrals allow immigrants to have a share of overeducated individuals similar to natives. However, we also find that referrals allow immigrants to be more undereducated than natives. This result supports the facts presented previously. Again, referrals seem to have a positive role in the integration of immigrants into the labor market [24].

The second panel presents the shares of occupational mismatch situations by gender and only for immigrants. Although referrals reduce the share of overeducated situations for both genders, we find that the share of overeducated individuals is higher for women than men. This is in line with previous works where women are more discriminated in the labor market, both in terms of

23. If the individual educational level increases, the probability of being overeducated increases. Indeed, the quantity of jobs for which the individual is perfectly matched or undereducated decreases if the individual educational level increases.

24. None of the results presented in this section informs us on the contribution of referrals to the probability of being in an occupational mismatch situation.

Figure 3.3 – Occupational mismatch and network effects - Decompositions according to individual characteristics



Source: authors' calculations, data from French LFS 2005-2012.
No-R and *R* respectively mean that the job is found without referral and workers find a job through a referral

wage and occupational choice (Weichselbaumer and Winter-Ebmer, 2005).

The third decomposition considers the number of years spent in France by immigrants. We distinguish individuals according to the year of arrival. If immigrants have arrived in the last three years, the immigrant is defined as a newcomer, if the immigrant has arrived beyond the last three years, the individual is defined as an established immigrant. The shares of overeducated individuals are higher for newcomers than for established immigrants. This is confirmed both for those who have found a job through a referral and for those who have not. However, if we focus only on newcomers, we notice that finding a job through a referral decreases the share of overeducated individuals and increases the share of undereducated individuals. Referrals have a positive role on the integration of newcomers into the labor market. Although we cannot check the causality of referrals on the share of occupational mismatch with this graph, we can however note differences in

terms of shares of occupational mismatch situations between the situations where individuals have found a job thanks to a referral of other job search methods.

Finally, the last decomposition is related to the origin of the diploma of immigrants. We note that individuals who have not obtained their last degree in France have higher shares of overeducation than immigrants graduated in France. However, the role of referral is heterogeneous depending on the origin of the diploma. Indeed, referrals do not allow immigrants without a degree obtained in France to reduce the share of overeducated individuals. Conversely, for immigrants graduating in France, referrals allow to increase the share of perfectly matched individuals. The *referral effect* can be explained by a better command of the language of the host country for certain origins. Indeed, as Ingwersen and Thomsen (2019) have shown, if there is better practice of the language of the host country for some origins, it allows them to interact more with the natives. The increase in these contacts with the natives is characterised in particular by better performances in the labor market (wage, employment).

4. Econometric specifications

The objective of our estimates is to assess the influence of social networks on occupational mismatch situations. For that purpose, we implement a Probit model with the occupational mismatch situation as dependent variable. We distinguish two samples for our analysis: overeducated and undereducated individuals. Each occupational mismatch situation is compared to the situation where individuals are perfectly matched. It should be noted that natives are excluded from our sample. We consider three different groups concerning immigrants: all immigrants, South-Europeans and North-Africans.

First, we estimate this Probit equation:

$$M_i^* = \beta_1 JFR_i + \beta_2 S_{Education,g} + \beta_3 FD_i + \beta_4 PT + \beta_5 RI_i + \beta_6 X_i + \epsilon_1 \tag{3.1}$$

M_i^* is a latent variable which characterizes the occupational mismatch situations. We estimate two sets of equation based on either overeducated and perfectly matched situations or undereducated and perfectly matched situations.

JFR_i is a dummy variable which takes the value 1 if an immigrant finds a job thanks to a referral or 0 otherwise. We do not have information about the origin of the referral. We only know that the referral is a friend or a family relation of the immigrant. The parameter of interest is β_1. It identifies the effect of the referral on the probability of being in an occupational mismatch

situation. This variable allows us to capture the direct network effect. Indeed, it informs us about the search mode used by the individual to find a job.

The transmission of job offers and therefore the quality of these ones depends directly on the social environment of individuals. We introduce the variable $S_{Education,g}$. This variable is built from the average education level observed in each neighborhood g. This variable is introduced in order to capture the externalities of the neighbourhood on the quality of the job held ((Jauhiainen, 2011); Damm, 2014). Indeed, the quality of the neighborhood has an impact on the performance of individuals in the labor market. We assume that this labor market performance can also induce the occupational choice of immigrants and thus the quality of the job of immigrants.

FD_i is a variable which takes the value 1 if the immigrant has been graduated in France, the variable takes the value 0 otherwise. From the literature on the transferability of human capital, we include this variable to capture the role of the origin of the diploma. This variable is constructed from the last degree obtained. This means that immigrants who have completed only part of their training in France are considered as having graduated in France. Individuals who have obtained a diploma less than or equivalent to the baccalaureate are considered to be *graduates* in their country of origin [25].

In our estimates, we have also integrated characteristics relating to the job held by individuals. We have integrated the variable PT characterizing the part-time job. This variable takes the value 1 if the worker held a part-time job. Indeed, according to the results of Nordin et al. (2010), individuals not in a full-time job have more penalties in the labor market. This is particularly characterized by a higher probability of being in an occupational mismatch situation.

The migration path of immigrants is also taken into account via the variable RI_i, a dummy variable based on the year of arrival of the immigrant. We distinguish immigrants according to their year of arrival. If the immigrant arrives in the three years preceding the survey, we consider the immigrant as a newcomer. If the immigrant has arrived beyond the three years preceding the survey, the immigrant is considered as an established immigrant. The introduction of this variable is motivated by the difficulties that newcomers may have in integrating into the labor market. These issues of integration can be explained in particular by lack of language skills of the host country (Aoki and Santiago, 2015).

25. Even if immigrants have not obtained diplomas in their country of origin, we consider them as *graduated* in their home country. These immigrants have acquired human capital in their country of origin such as language, specific work experience or initial educational training.

X_i consists of individual characteristics as age, marital status, gender and children. We introduce the country of origin as factorial variable for estimates with all immigrants. In addition, we also introduced fixed effects such as years and regions.

Second, we implement a bivariate Probit model to estimate the probability of being in an occupational mismatch situations. As the variable *Job finding through a referral* does not give us information and characteristics about the referral, this variable could depend on factors related to the residential environment. The bivariate Probit model allows us to control the endogeneity of the variable *Job finding through a referral*.

The bivariate Probit model makes it possible to simultaneously estimate the probability of being in an occupational mismatch situation and the probability of finding a job through a referral. The implementation of this model allows us to correct the potential endogeneity bias. Indeed, the previous estimation assumes a perfect exogeneity between variables *Finding a job through a referral* and *Occupational mismatch*. However, it is likely that the jobs transmitted by the referrals are influenced by the residential environment of the immigrants (from an economic and social point of view). The estimation of the equation with the variable *Finding a job through a referal* is used to estimate the equation with the occupational mismatch index as dependent variable. To check the quality of the model, we test the significance of ρ, the coefficient of correlation of residuals (ϵ_1, ϵ_2). If the residual correlation coefficient is significantly different from 0, then the bivariate Probit model is validated. It means that the bivariate Probit is more appropriate to estimate the probability of being in an occupational mismatch situation. Otherwise, the two Probit models can be estimated independently. The model takes the following form:

$$\begin{cases} M_i^* = \beta_1 JFR_i + \beta_2 S_{Education,g} + \beta_3 FD_i + \beta_4 PT + \beta_5 RI_i + \beta_6 X_i + \epsilon_1 \\ JFR_i^* = \alpha_1 S_{Education,g} + \alpha_2 RI_i + \alpha_3 S_{gt} + \alpha_4 U_{gt} + \alpha_5 X_i + \epsilon_2 \end{cases} \tag{3.2}$$

where residuals (ϵ_1, ϵ_2) follow a bivariate normal distribution with correlation coefficient ρ (to be estimated):

$$(\epsilon_1, \epsilon_2) \sim \mathcal{N}(0, 0, 1, 1, \rho) \tag{3.3}$$

We use the same notations for the first and second equations. Latent variables are M_i^* and JFR_i^* which respectively correspond to being in an occupational mismatch situation [26] and to

26. We also distinguish two samples in the estimates: overeducated and perfectly matched on the one hand and

finding a job through a referral.

RI_i allows us to distinguish immigrants according to their year of arrival in France. The introduction of this variable into the equation with JFR_i^* as dependent variable is justified by the work of Goel et al. (2016). They find that thanks to their social network, recent immigrants find a job more easier. The use of social networks by newcomers enables them to benefit from support when they arrive in the host country. This support depends on both the structure of the social network (peers) in the host country [27] but also the relationship between newcomers and peer members.

We add the variable S_{gt} in the equation with JFR_i^* as dependent variable. This variable corresponds to the share of immigrants living in each neighborhood g. We do not distinguish immigrants according to their origin. The literature has shown that the job search mode influences the probability of being in an occupational mismatch situation. (Kucel and Byrne (2008) using UK data and Carroll and Tani (2015) using Australian data). At the same time, finding a job through a referral depends on the social composition of the neighborhood, of the environment (Lancee, 2016; Alaverdyan and Zaharieva, 2019). The introduction of this variable is motivated by the fact that the relation identified in the literature between these variables. The occupational mismatch situations are explained by job-search method (referral or formal method), but the probability to find a job depends on the social environment of individuals. To calculate the variable S_{gt}, we take the weight of immigrants living in the neighborhood divided by the total weight of the population (natives and immigrants) living in the same neighborhood. The introduction of this variable is based on the work of Calvo-Armengol and Jackson (2004a) or Jackson (2010). Authors find that people prefer to interact with other individuals having similar characteristics. Applied to immigrants, homophily is characterized by a preference of immigrants to interact with other immigrants. As a result, the introduction of this variable measures the influence of the social environment and more particularly of the neighborhood composition on the probability of finding a job through a referral and indirectly on the probability of being in an occupational mismatch situation.

We introduce fixed effects into the estimates such as years and regions. As for exogenous estimates, we introduce individual factors as well as the origin of immigrants for estimates with all

undereducated and perfectly matched on the other hand. An occupational mismatch situation is compared, in each case, with a perfectly matched situation.

27. The migratory history in the host country of the groups of origin characterised by the stock of immigrants as well as the integration of immigrants established in the host country are determining factors in the support available to newcomers when they arrive in the host country.

immigrants without distinction of origin.

5. Results

5.1 Probit estimates

In a first step, we analyze the relationship between the probability of being in an occupational mismatch situations and the role of the referral. Tables 3.2 and 3.3 present the Probit-estimates with a sample composed of overeducated and perfectly matched immigrants on the one hand and undereducated and perfectly matched immigrants on the other hand. In addition to this distinction, we decompose the estimates according to the origin of the acquisition of human capital (or part of human capital).

Table 3.2 – Probit - Marginal Effects - Overeducated situations

	All samples			Graduated in France			Graduated in home country		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All immigrants	SE	NA	All immigrants	SE	NA	All immigrants	SE	NA
Finding a job through a referral	-0.023**	-0.036**	-0.043***	0.012	-0.032	0.001	-0.054***	-0.050**	-0.102***
	(0.010)	(0.016)	(0.017)	(0.013)	(0.023)	(0.021)	(0.014)	(0.022)	(0.026)
Educational average (neighborhood)	0.028***	0.024***	0.031***	0.028***	0.024***	0.025***	0.028***	0.022***	0.042***
	(0.002)	(0.005)	(0.004)	(0.003)	(0.007)	(0.005)	(0.004)	(0.006)	(0.008)
French Diploma	-0.048***	0.012	-0.056***						
	(0.009)	(0.017)	(0.015)						
Part-time	0.028***	0.097***	0.018	0.062***	0.108***	0.068***	-0.003	0.086***	-0.033
	(0.010)	(0.021)	(0.018)	(0.014)	(0.028)	(0.022)	(0.015)	(0.029)	(0.027)
Recent immigrant (< 3 years)	0.075***	0.046	0.119***	0.166***	0.125*	0.179*	0.078***	0.039	0.116***
	(0.017)	(0.028)	(0.036)	(0.039)	(0.069)	(0.100)	(0.020)	(0.032)	(0.040)
Control variables									
Individual control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Origin control	YES	NO	NO	YES	NO	NO	YES	NO	NO
Year control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	15,397	2,152	5,214	8,629	1,310	3,317	6,768	801	1,897

t statistics in parentheses

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

We include age, age^2, gender, children and marital status as individual control variables.

SE : South-Europeans; NA: North-Africans samples

5.1.1 Overeducated situations

First, we focus on columns (1)-(3) of table 3.2. Our parameter of interest is associated with the variable *job finding through a referral*. We can see that the estimated parameter is negative and significant for the estimations composed of samples of all immigrants, South-Europeans and North-Africans. This result shows that finding a job through a referral reduces the probability of being overeducated. This main result confirms our hypothesis based on the positive influence of social relations for the integration of immigrants on the labor market. Finding a job through a referral decreases the likelihood of being overeducated by 2.3% to 4.3% according to the origin.

In columns (4)-(9), we estimate the same models with different samples. We distinguish immigrants according to the origin of the human capital (educational skills) [28]. The results, in columns (4)-(6), show that for immigrants who have graduated in France, finding a job through a referral does not influence the probability of being overeducated. Conversely, if we focus on immigrants who have not obtained a diploma in France (columns (7)-(9)), we notice that for this population, finding a job through a referral reduces the probability of being overeducated by 5% to 10.2%.

These different results according to the origin of the diploma allow us to suppose that the quality of the jobs transferred by the referrals is not homogeneous according to the migratory path of the individuals.

The estimated parameter associated with the variable *Recent immigrant* measures the probability of being in an occupational mismatch situation according to the year of arrival of immigrants. In Table 3.2, the results show that being a newcomer increases the probability of being overeducated except for samples composed of South-Europeans without distinction according to the origin of the diploma and for South-Europeans graduated in home country. This result confirms the difficulties of integrating immigrants into the labour market when they settle in a new country. One explanation for the difficulties of newcomers in finding a job for which they have the required educational skills may relate to human capital. The ability of immigrants to acquire the language skills of the host country upon arrival can be a barrier in the job search. Indeed, educational and professional skills acquired in the country of origin may not be valued because of the difficulties of individuals

28. This variable allows us to distinguish between individuals by incorporating information about where the last degree was obtained. In the case where immigrants have completed higher education, we know whether the individual has graduated in his or her country of origin or not. If the individuals have not obtained higher degrees, neither in France nor in their host country, we assume that the individuals have been graduated in the country of origin. This assumption is based on the origin of human capital. Even if individuals did not obtain a degree in their country of origin, they have acquired skills specific to the country of origin (e.g. language skills).

to communicate with natives in the language of the host country.

In columns (1)-(3), the results show that obtaining the last diploma in France reduces the probability of being overeducated. This informs us that immigrants graduated in France have a better integration in the labor market in the sense that their level of education corresponds to the level of education required for the job held. This result is significant for samples composed of immigrants without distinction of origin as well as North Africans. Obtaining a diploma in France decreases the probability of being overeducated by 4.6% to 5.6%. This result characterizes the limits of human capital transfer between the home country and the host country's labor market. To limit the negative effect linked to this human capital transfer, it should be noted that the estimated parameter characterising the network effect is significant only for immigrants graduated in the home country. The use of referrals can be justified as a means of limiting the difficulties of integration into the labor market of the host country.

Concerning the variable *Part-time*, the estimated parameter is positive for all estimates in which the parameter is significant. This result confirms those obtained in the literature showing that part-time workers are more overeducated than full-time workers (Nordin et al., 2010).

The parameter associated to the variable *Educational average* allows to measure the externalities of the neighborhood on the occupational mismatch. Indeed, this variable measures the average educational level observed in the neighborhood. The estimated parameter contributes to capture the effect of a variation of the average education level in the neighborhood on the probability of being overeducated.

In columns (1)-(3), the results show that an increase in the average education level in the neighborhood increases the probability of being overeducated for the estimates with immigrants (regardless of origin), South-Europeans and North-Africans. These results are the same for estimates based on samples composed of immigrants graduated in the host country (columns (4)-(6)) or graduated in the home country (columns (7)-(9)). It means that the higher the average educational level in the neighborhood, the greater the likelihood of being overeducated for immigrants. This means that the educational level of jobs transmitted by the neighborhood decreases as the average educational level of the neighborhood increases. Focusing on individual characteristics rather than jobs means that the individual educational level increases as the average education level of the neighborhood increases. However, passed on job opportunities do not allow immigrants to find a job for which they have an educational level that corresponds to the educational level required for the job.

5.1.2 Undereducated situations

Table 3.3 – Probit - Marginal Effects - Undereducated situations

	All samples			Graduated in France			Graduated in home country		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All immigrants	SE	NA	All immigrants	SE	NA	All immigrants	SE	NA
Finding a job through a referral	-0.022***	-0.072***	-0.017	0.006	-0.046**	0.004	-0.041***	-0.083***	-0.032
	(0.008)	(0.015)	(0.014)	(0.010)	(0.022)	(0.017)	(0.011)	(0.020)	(0.020)
Educationnal average (neighborhood)	-0.044***	-0.058***	-0.030***	-0.028***	-0.030***	-0.032***	-0.054***	-0.066***	-0.026***
	(0.002)	(0.005)	(0.004)	(0.003)	(0.008)	(0.005)	(0.003)	(0.006)	(0.007)
French Diploma	-0.386***	-0.450***	-0.406***						
	(0.006)	(0.011)	(0.010)						
Part-time	-0.008	0.056***	-0.055***	0.010	0.071***	-0.026	-0.015	0.051**	-0.076***
	(0.009)	(0.020)	(0.016)	(0.010)	(0.027)	(0.018)	(0.013)	(0.026)	(0.023)
Recent immigrant (< 3 years)	-0.113***	-0.134***	-0.060*	-0.054	0	0	-0.142***	-0.167***	-0.105**
	(0.017)	(0.034)	(0.036)	(0.077)	(.)	(.)	(0.021)	(0.039)	(0.047)
Control variables									
Individual control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Origin control	YES	NO	NO	YES	NO	NO	YES	NO	NO
Year control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	17,978	3,821	6,368	7,271	1,362	2,901	10,707	2,449	3,459

t statistics in parentheses

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

We include age, age^2, gender, children and marital status as individual control variables.

SE : South-Europeans; NA: North-Africans samples

Undereducation situations characterize cases where workers have a level of education below the median education level observed in their job. These situations can be assimilated to cases where workers are better integrated into the labor market. Indeed, this illustrates the fact that workers are in a position to use specific skills, their talent, to find a job. The particularity of these skills lies in the fact that they are not valued by a diploma. In asymmetric information models, firms are not able to obtain a signal about the quality of workers. However, if we consider that workers are in a position to showcase their talent, this characterises their ability to integrate into the labor market. Applied to the case of immigrants, if individuals are in a job in which they are undereducated, this presupposes that they are able to compensate for the lack of qualifications with specific skills acquired either in the host country or in the country of origin. If the skills were acquired in the country of origin, this may characterise a talent associated with the immigrants' origin.

Table 3.3 presents the results of undereducated workers. The associated paremeter with the variable *Job finding through a referral* is significant and negative for all immigrants, immigrants graduated in home country and South-Europeans (columns (1), (2), (5), (7) and (8)). The role of referral has no significant effect on the likelihood of being undereducated for North Africans. Finding a job through a referral decreases the probability of being undereducated by 2.1% to 8.3%. Referrals have a negative role in the integration of immigrants into the labor market for undereducated situations. Various hypotheses can be put forward to explain this result: *i)* immigrants with a talent to be valued on the labor market do not mobilise their network to find a job *ii)* the network does not allow immigrants to develop their talent on the labor market.

The role of referral, in undereducation situations, depends on the origin of the immigrants. Despite this, we note that for the same origin, the effect associated with human capital is similar whatever the origin of the diploma.

Being a newcomer decreases the probability of being undereducated. If we consider the undereducation situations as a better situation on the labor market, we could consider that the year of arrival has a negative effect on the integration of workers who value their skills to find a job. Immigrants' skills are not directly transferable to the host country labor market. These results apply both to immigrants who have graduated in France and to immigrants who obtained their diploma in the country of origin (columns). This result mainly characterizes the fact that it takes time for immigrants to adapt to the host country before they can expect to use their non-educational skills in the labor market. This result is in line with estimates of overeducation.

In columns (1)-(3), the estimated parameter associated to the variable *French Diploma* is significant and negative. Being graduated in France reduces the probability of being undereducated. One explanation that could justify this result could be based on the fact that immigrants who obtained the diploma in their country of origin have more non-educational skills to offer on the labor market, while immigrants who obtained a diploma in France try more to use their diploma in jobs for which they are qualified. This hypothesis could be based on the fact that the network effect is significant for immigrants without distinction of origin and South-Europeans in the case of immigrants with a diploma in the country of origin, whereas for immigrants with a French diploma, the network effect is significant only for South-Europeans. The relationship between this network effect and the origin of the diploma characterizes the support of the social network to find a job for immigrants. The fact that the network effect is more significant for immigrants with diplomas from the country of origin shows that this group of individuals (i.e. immigrants with diplomas from

the country of origin) has specific skills to offer on the labor market in contrast to immigrants with French diplomas.

Conversely to the estimates based on the overeducated situations, the estimated parameter associated to the variable *Educational average* is significant and negative, i.e. an increase in the average educational level in the neighborhood decreases the probability of being undereducated.

These results are identical both for all origins but also for the samples distinguishing immigrants according to the origin of the diploma (columns (1)-(9)).

This result characterizes, as the overeducation situations, the influence of the average education level of the neighborhood on the probability of being in an undereducation situation. The educational level in the neighborhood does not allow immigrants to find a job for which they have a lower level of education than that required for the job. This means that as the educational level in the neighborhood increases, the educational level required for the jobs offered by the neighborhood decreases. This result for the average education level of the neighborhood is identical to the one obtained for overeducation situations.

5.2 Bivariate Probit estimates

In this section, we present the results obtained from the estimates in which we implement a bivariate Probit. The Probit bivariate allows us to endogenize the variable *Job finding through a referral*. As noted above, this variable does not provide us with information about the origin of the intermediate. The probability of finding a job through a referral can be influenced by residential factors without these factors directly affecting the probability of being in an occupational mismatch situation. Like the previous estimates, we distinguish between over- and undereducation situations, the origin of the individuals (all immigrants, South-Europeans and North-Africans) as well as the origin of the immigrant's diploma. It should be noted that the interpretation of the results depends on the significance of the residual correlation test. Indeed, if the correlation test is not significantly different from 0, it means that the independently estimated probits are more appropriate for estimating the probability of being in an occupational mismatch situation.

5.2.1 Overeducated situations

The residual correlation test is significantly different from 0 for immigrants graduated in France, South-Europeans and North-Africans (columns (2), (4) and (5)). Therefore, we focus only on those estimates to interpret the results.

Table 3.4 – Bivariate Probit - Marginal Effects - Overeducated situations

	(1)		(2)		(3)		(4)		(5)	
	All		Graduated in France		Graduated in home country		South-Europeans		North-Africans	
VARIABLES	OM	JFR	OM	JFR	OM	JFR	OM	JFR	OM	JFR
JFR	OM	JFR								
Finding a job through a referral	-0.076		0.485***		-0.335		-0.361***		0.395***	
	(0.727)		(0.021)		(0.734)		(0.074)		(0.050)	
Educationnal average (neighborhood)	0.026**	-0.009	0.021***	-0.002	0.020	-0.015	0.011	-0.007	0.027***	
	(0.012)	(0.008)	(0.004)	(0.004)	(0.035)	(0.011)	(0.008)	(0.011)	(0.005)	
French diploma	-0.067	-0.090***					-0.072***	-0.152***	-0.039**	
	(0.068)	(0.016)					(0.026)	(0.034)	(0.019)	
Part-time	0.034**		0.052***		0.003		0.110***		0.024	
	(0.014)		(0.012)		(0.017)		(0.026)		(0.019)	
Recent immigrant ($<$ 3 years)	0.088*	-0.044*	0.131***	-0.095**	0.078	-0.026	0.050	-0.026	0.048	0.124***
	(0.048)	(0.023)	(0.039)	(0.048)	(0.089)	(0.029)	(0.049)	(0.074)	(0.042)	(0.043)
% of immigrants in the neighborhood		0.081		0.109***		0.080		0.216**		0.107**
		(0.082)		(0.034)		(0.101)		(0.104)		(0.045)
Unemployment rate (neighborhood)		0.048		0.208***		-0.194		-0.267		0.263**
		(0.232)		(0.080)		(0.157)		(0.180)		(0.114)
rho	0.148		-0.939***		0.623		0.916***		-0.836***	
	(1.419)		(0.040)		(1.598)		(0.094)		(0.088)	
Control variables										
Individual control	YES		YES		YES		YES		YES	
Origin control	YES		YES		YES		NO		NO	
Year control	YES		YES		YES		YES		YES	
Region control	YES		YES		YES		YES		YES	
Observations	7,803		4,316		3,487		1,067		2,717	

t statistics in parentheses

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

We include age, age^2, gender, children and marital status as individual control variables.

For South-Europeans (column (4)), the significant parameters in the estimation with *Finding a job through a referral* as a dependent variable are associated with the variables *Share of immigrants in the neighborhood* and *Origin of the diploma*. The percentage of immigrants living in the neighborhood positively influences the probability of finding a job through a referral. This result highlights the support of immigrants for the integration of peers in the labor market. A 1% increase in the percentage of immigrants in the neighbourhood increases the likelihood of finding a job through a referral of 21.6%.

The estimated parameter associated with the variable *French Diploma* is significant and negative. Being graduated in France, for South-Europeans decreases the probability of finding a job through a referral. This result can be explained in particular by the fact that immigrants who have not been graduated in France can compensate for this lack of human capital acquired in the host country by mobilising their social network. Conversely, the acquisition of part of the human capital in France by South-Europeans who have been graduated in France can enable these individuals to set up a formal job-search way to find a job. Indeed, the use of a traditional job-search method presupposes that immigrants are able to put forward at least their professional, educational or linguistic skills. The mobilization of social networks to find a job by immigrants graduated in the home country can be justified by compensating for the lack of human capital acquired in the host country.

When the dependent variable is *Overeducated situations*, the parameter associated to the variable *Job finding through a referral* is significant and negative for South-Europeans. It means that finding a job through a referral decreases the probability of being overeducated. In other words, finding a job through a referral helps South-Europeans to integrate the labor market by finding a job for which the educational level of immigrants matches with the one required for the job.

Indirectly, a positive change in the percentage of immigrants in the neighbourhood will decrease the probability of being overeducated. It means that an increase of the share of immigrants into the neighborhood will positively affect the quality of jobs held by South-Europeans.

Column (2) presents results for the estimate with immigrants graduated in France as sample. Variable *Finding a job through a referral* is influenced by variables *recent immigrants*, *share of immigrants in the neighborhood* and the *unemployment rate in the neighborhood*.

Being a newcomer reduces the probability of finding a job through a referral for immigrants graduated in France by 9%. This result can be explained by the fact that graduated immigrants in France, even if they arrived recently, were able to create links with both peers and natives.

This multiplication of exchanges, notably created by the acquisition of human capital in the host country, increases the possibility of creating links and therefore of finding a job through a referral.

Peer effect have a positive impact on the probability of finding a job through a referral. When the share of immigrants increases in the residential environment, this increases the probability of finding a job through a referral (column (2)). We have the same results for North-Africans (column (5)). An increase of immigrants in the neighborhood increases the probability of finding a job through a referral.

Finally, regarding the economic effect of place of residence, an increase in the unemployment rate in the urban area increases the probability of finding a job through a referral for immigrants graduated in France and North-Africans (columns (2) and (5)). This effect assumes that individuals mobilize their network more when the economic conditions in the urban area are unfavourable. It should be noted that indirectly, when the unemployment rate increases in the urban area, even if it increases the probability of finding a job through a referral, it also affects the quality of the job held by workers.

Indeed, it should be noted that finding a job through a referral increases the probability of being overeducated for immigrants graduated in France and North-Africans. The estimated parameter associated to the variable *Job finding through a referral* is positive and significant for these two samples. Even if there is support from referrals to integrate into the labor market, this support is relative and limited if we consider the match between the educational level of immigrants and the educational level required for the job.

It means that if the share of immigrants increases in the neighborhood, it increases the probability of finding a job through a referral but the fact to find a job through a referral increases the probability of being overeducated. This positive effect on the relationship between the share of immigrants and the transmission of jobs through a referral is characterized by a negative effect on the quality of jobs transmitted by referrals.

Concerning the year of arrival of North Africans, the estimated parameter associated with this variable is significant and positive. Being a newcomer increases the probability of finding a job through a referral. The fact that the use of social networks is higher for newcomers (compared to established immigrants) can be explained by the support that these immigrants can benefit from when they arrive in the host country. This result is confirmed when we consider the effect of referral on the quality of the jobs passed on. Even if the probability of finding a job through a referral increases for newcomers, it increases the probability of being overeducated.

The change in sign of the estimated parameter between the Probit and bivariate Probit models can be explained by the lack of identification with the Probit model. The endogeneity of *Job finding through a referral* could explain the inconsistency of the Probit estimates for North-Africans and immigrants graduated in France. In the Probit-estimates, we do not correct for endogeneity bias. However, it should be noted that depending on the samples, the best strategy to estimate the model is not always the bivariate Probit but can be a simple Probit. However, this is not the case neither for immigrants graduated in France, South-Europeans and North-Africans.

The socio-economic characteristics of the neighborhood positively influence the integration of immigrants into the labour market in the sense that if there is a change in one of these variables, i.e. an increase in the unemployment rate or an increase in the proportion of immigrants in the neighborhood, immigrants will find a job more easily through a referral. However, job referrals do not allow immigrants to find a job for which they have the required educational level.

5.2.2 Undereducated situations

For the undereducation situations, the residual correlation test is significantly different from 0 for the estimates with all immigrants, immigrants graduated in the home country and South-Europeans (columns (1), (3) and (4) in Table 3.5). We focus only on these estimates to interpret the results.

Finding a job through a referral decreases the probability of being undereducated for all estimates. If we consider the undereducation situation as characterizing a good integration of immigrants in the labor market, the referral has a negative role. However, this result should not only be seen as a negative effect on the integration of immigrants. In fact, the undereducation situation means that immigrants occupy a job for which they have a lower educational level than the educational level observed in the job they occupy. Therefore, if individuals are in a job for which they are undereducated, it means that they value non-educational skills in the labor market. The role of referral, in these estimates, is therefore to help immigrants to value their skills in cases where the human capital acquired in the country of origin, for instance, allows them to offer specific skills on the labor market.

In column (1), the probability to find a job through a referral is influenced by the origin of the diploma and the share of immigrants living in the neighborhood. Obtaining a diploma in France reduces the probability of finding a job through a referral, in other words, immigrants graduated in the home country mobilize their network more than immigrants graduated in France. The

Table 3.5 – Bivariate Probit - Marginal Effects - Undereducated situations

	(1)		(2)		(3)		(4)		(5)	
	All		Graduated in France		Graduated in home country		South-Europeans		North-Africans	
VARIABLES	OM	JFR	OM	JFR	OM	JFR	OM	JFR	OM	JFR
JFR	OM	JFR								
Finding a job through a referral	-0.353***		0.041		-0.394***		-0.421***		0.069	
	(0.043)		(0.095)		(0.041)		(0.029)		(0.089)	
Educationnal average (neighborhood)	-0.034***	-0.006	-0.019***	-0.012**	-0.038***	0.000	-0.034***	0.020**	-0.024***	-0.016**
	(0.003)	(0.004)	(0.003)	(0.005)	(0.005)	(0.005)	(0.008)	(0.009)	(0.006)	(0.006)
French Diploma	-0.383***	-0.100***					-0.412***	-0.114***	-0.431***	-0.076***
	(0.020)	(0.012)					(0.026)	(0.028)	(0.018)	(0.019)
Part-time	-0.016*		0.003		-0.023*		0.026		-0.049**	
	(0.009)		(0.012)		(0.013)		(0.019)		(0.020)	
Recent immigrant (< 3 years)	-0.093***	-0.019	-0.828***	-0.141*	-0.115***	-0.025	-0.091*	0.007	-0.101**	0.032
	(0.021)	(0.025)	(0.052)	(0.083)	(0.026)	(0.029)	(0.047)	(0.064)	(0.050)	(0.052)
% of immigrants in the neighborhood		0.112***		0.008		0.159***		0.327***		-0.082
		(0.026)		(0.051)		(0.034)		(0.065)		(0.053)
Unemployment rate (neighborhood)		-0.023		0.249**		-0.122		-0.272**		0.122
		(0.061)		(0.101)		(0.084)		(0.125)		(0.106)
rho	0.774***		-0.142		0.717***		0.872***		-0.171	
	(0.102)		(0.357)		(0.103)		(0.075)		(0.169)	
Control variables										
Individual control	YES		YES		YES		YES		YES	
Origin control	YES		YES		YES		NO		NO	
Year control	YES		YES		YES		YES		YES	
Region control	YES		YES		YES		YES		YES	
Observations	9,284		3,613		5,671		1,942		3,365	

t statistics in parentheses

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

We include age, age^2, gender, children and marital status as individual control variables.

share of immigrants positively influenced the probability of finding a job through a referral. An increase of 1% of the share of immigrants in the neighborhood increases the likelihood of finding a job through a referral between 11 and 32% according to the samples (columns (1), (3) and (4)). The homogeneity of these results, according to the different situations of occupational mismatch, characterizes the influence of the social environment for immigrant populations. Indeed, whatever the occupational mismatch situation, the share of immigrants in the neighborhood has a positive effect on the probability of finding a job through a referral.

Concerning South-Europeans (column (4)), the variable relating to the economic environment of the neighborhood also affects the probability of finding a job through a referral. The results are opposite to overeducation situations. An increase in the unemployment rate decreases the probability of finding a job through a referral. This result can be explained by the sample used for these estimates. Indeed, since we estimate the probability of being in an undereducation situation, the sample is composed of individuals in an undereducation situation and perfectly matched. However, as previously mentioned, undereducation situations characterize the fact that individuals are able to demonstrate non-educational skills in the labor market. As a result, the educational signal (i.e. the diploma) cannot be used by firms to recruit their future employees. If economic conditions are worsening in an urban area but a firm needs to recruit relying on the diplomas of individuals as a signal of the quality of workers, the firm will not recruit individuals who do not have degrees. The probability of being undereducated, during recession decreases because of the lack of educational signals from workers.

The origin of the diploma influences the probability to find a job for sample of immigrants without distinction of origin and South-Europeans (columns (1) and (4)). Being graduated in France reduces the probability of finding a job through a referral. This means that immigrants with a degree from their country of origin compensate for the lack of human capital acquired in France by mobilising their social network to integrate into the labor market. However, the use of the social network to find a job reduces the probability of being in a situation of undereducation for immigrants. As a result, even if newcomers make greater use of their social networks to find a job, this affects the quality of the jobs they hold.

6. Conclusion

Using the French LFS, we study the factors influencing the probability of immigrants to be in a situation of either overeducation or undereducation. In a context where the integration of immigrants into the host countries has attracted attention in political and public debates, taking into account the economic performance of immigrants in the host country labor market arises as a major issue. Host countries have an interest in promoting the successful integration of immigrants so as to maximise the use of available skills. Indeed, immigrants, whether or not held a French degree, have educational skills to be valued in the labor market. These educational skills can also be characterised by specific skills depending on the origin of the individuals.

In this paper, occupational mismatch situations are defined according to the median education level observed for each job. If the education level of immigrants differs from this median education level by more or less one standard deviation, immigrants are either over- or undereducated. We show that referrals have a significant role on both overeducation and undereducation situations. However, even if referrals allow immigrants to decrease the probability of being in overeducation situations, i.e. they help immigrants to have a good quality of employment, the effect of referrals is heterogeneous when taking into account the origin of immigrants' diplomas.

We rely on a Probit specification which allows us to endogeneize the effect of the residential environment on the probability of being in an occupational mismatch situation. To do so, we integrate variables related to the economic and social environment. The results show that the effect of referrals is heterogeneous according to the origin of the individuals (South-Europeans or North-Africans). This can notably be explained by the structures of social networks since the first migratory waves of these two origins. Indeed, we focus on these two origins because of their almost simultaneous migratory waves since the post-war period. However, both origins experienced different integrations during the following decades. Indeed, while South-Europeans have diversified their location choice on the territory, North-Africans have concentrated more within large urban areas. The heterogeneity of these integration processes allows us to characterize the understanding of the social and economic environment of these two origins.

Finally, in general, the results show that the probability of finding a job through a referral, whatever their origin, is sensitive to variations in the proportion of immigrants present in the neighborhood. This result is in line with the literature on homophily (Kucel and Byrne, 2008; Carroll and Tani, 2015).

From a public policy point of view, this paper allows us to characterize the fact that social

and economic environments of immigrants influences both the probability of finding a job through social relations and the quality of the jobs held by individuals. The transmission of jobs by referrals is positioned as a necessary complement to maximise the use of immigrants' educational skills on the labor market. However, the role of referrals is called into question when it comes to enabling immigrants to highlight non-educational skills on the labour market.

Conclusion Générale

1. Effets réseaux et intégration sur le marché du travail

Au cours de ces dernières décennies, les flux de population vers l'Europe ont évolué tant quantitativement que qualitativement (Castles 2014; Van Mol and De Valk 2016). Ces rapides changements se positionnent dans un contexte politique et médiatique, relatif à l'immigration, caractérisé par des débats souvent connotés quant à la gestion de l'arrivée de nouveaux individus sur le territoire.

De prime abord, la migration peut être perçue comme une décision individuelle caractérisée par un déplacement entre deux territoires. Or, cette action se positionne dans un schéma dans lequel les choix individuels sont influencés par l'environnement social et économique. De ce fait, l'objectif de cette thèse est de contribuer à la littérature relative à l'intégration des immigrés sur le marché du travail dans les pays d'accueil. Plus spécifiquement, nous plaçons au centre de notre analyse les relations sociales comme un moyen d'intégrer le marché du travail via la transmission des opportunités d'emplois, mais également comme un facteur influençant l'inadéquation professionnelle des immigrés.

Le premier chapitre propose une revue de la littérature présentant les théories du choix migratoires et les déterminants relatifs à l'intégration des immigrés dans les pays d'accueil. L'analyse de ces deux sujets relatifs à la migration se justifie par le traitement de la migration comme une action ne se limitant pas simplement au déplacement de l'individu. Nous positionnons la migration comme un processus caractérisé à la fois par une décision de déplacement, mais également par un processus d'intégration dans le pays d'accueil (Wilkinson 2018; Eggebo and Brekke 2019).

Les motivations initiales relatives à la décision de migrer conditionnent les objectifs des individus dans le pays d'accueil. En fonction de la durée de la migration (temporaire ou permanente, voir Dustmann and Görlach 2016), les motivations de la migration (contraintes ou économiques, voir Ruiz and Vargas-Silva 2018), les incitations des immigrés à investir dans le capital humain dans le pays d'accueil ou à s'insérer sur le marché du travail sont différentes selon les caractéristiques individuelles des migrants (Clarke et al. 2019). Au-delà de ces caractéristiques individuelles, les choix et actions des individus à migrer ou bien à s'intégrer dans la société d'accueil dépendent également de facteurs sociaux (Munshi 2003; Patel and Vella 2013a).

L'influence des interactions sociales, appliquée au marché du travail, se caractérise par la transmission d'offres d'emplois entre individus (Granovetter 1974; Calvo-Armengol and Jackson 2004b). Appliqué à la population immigrée, le rôle des réseaux sociaux peut avoir un effet vertueux, en facilitant l'accès au marché du travail (Lancee 2016; Alaverdyan and Zaharieva 2019), ou bien vi-

cieux via des performances économiques inférieures lorsque les immigrés trouvent un emploi grâce à un intermédiaire (Addison and Portugal 2002, Bentolila et al. 2010; Zaharieva 2018).

Au-delà de l'influence concernant la position sur le marché du travail, les réseaux sociaux influencent également les choix d'occupation des immigrés ainsi que la qualité des emplois occupés par les immigrés (Patel and Vella 2013a, Chort 2017, Kalfa and Piracha 2018). Concernant l'influence relative aux choix d'occupation, la proximité résidentielle des immigrés ainsi que la présence de pairs dans le voisinage sont des facteurs favorisant les contacts entre les individus et donc la transmission d'opportunités d'emplois. L'incitation à mobiliser le réseau social pour intégrer le marché du travail est, dans cette situation, forte. Or, cette action peut entrainer une concentration des immigrés au sein de certaines occupations selon l'origine et le lieu de résidence (Patel and Vella 2013a). Une des conséquences relatives à cette ségrégation occupationnelle des immigrés réside dans la non-utilisation des compétences éducationnelles disponibles dans la société d'accueil. En effet, cette concentration des immigrés au sein de certaines professions peut être caractérisée par un mauvais appariement entre le niveau d'éducation des individus et le niveau d'éducation requis pour l'emploi occupé (Aleksynska and Tritah 2013, Chort 2017, or Kalfa and Piracha 2018).

Afin de prolonger cette littérature relative à l'influence des réseaux sociaux sur l'intégration des immigrés sur le marché du travail, nous menons dans les Chapitres 2 et 3 des analyses empiriques basées sur les Enquêtes Emplois françaises en positionnant l'effet réseau au centre de nos recherches.

Le deuxième chapitre met en avant la relation entre l'effet réseau et le cycle économique. Notre analyse est motivée par plusieurs faits stylisés. Tout d'abord, nous nous basons sur le rôle des relations sociales dans la transmission des emplois (Calvó-Armengol and Zenou 2005; Galenianos 2014). Nous montrons que les immigrés mobilisent davantage leurs relations sociales pour trouver un emploi que les natifs. De plus, nous montrons également que la mobilisation des relations sociales n'est pas homogène selon l'origine des immigrés. Le deuxième fait s'appuie sur l'utilisation des employés par les firmes comme un moyen de recrutement (Ioannides and Datcher Loury 2004; Topa 2001). La motivation des firmes à utiliser ce mode de recrutement se justifie notamment par la qualité des travailleurs recrutés lorsqu'ils sont recommandés par une tierce personne (Pallais and Sands 2016).

Notre analyse est caractérisée par l'introduction de deux indicateurs nous permettant de capturer l'effet réseau. Le premier indicateur se base sur la probabilité de trouver un emploi grâce à un tiers (liens directs). Le second indicateur intègre l'effet des pairs en intégrant la proportion d'immigrés dans chacun des emplois selon l'origine des individus. A partir de cette information,

pour les immigrés ayant récemment trouvé un emploi ou bien arrivés récemment en France, nous proposons un indicateur mettant en relation le choix d'occupation de l'individu et la proportion d'immigrés présents dans l'emploi.

Nous observons que le rôle de l'effet réseau est contracyclique. En phase de récession économique, les immigrés mobilisent davantage leurs réseaux sociaux pour trouver un emploi. Ces résultats se confirment tant pour les liens directs que l'effet des pairs. Concernant l'indicateur basé sur l'effet des pairs, les résultats caractérisent une plus forte probabilité de trouver un emploi dans lequel la proportion d'immigrés est faible en période de croissance économique. En effet, du fait de l'abondance des opportunités d'emplois sur le marché, les immigrés ont tendance à moins se concentrer durant ces périodes de croissances. A l'inverse, la tendance à la concentration des immigrés au sein de certaines occupations durant les périodes de récession économique illustrent les difficultés des immigrés à s'intégrer sur le marché du travail lorsque celui-ci devient plus compétitif.

Le troisième chapitre se focalise sur la relation entre le surclassement/déclassement professionnel et l'effet réseau. L'insertion professionnelle des immigrés est une question majeure des sociétés d'accueil. La non-utilisation des ressources éducationnelles, concernant les immigrés, peut être expliquée par la non-transférabilité du capital humain acquis dans le pays d'origine (Chiswick and Miller 2009c). L'absence de reconnaissance des compétences éducationnelles des immigrés dans le pays peut se caractériser par des situations où le niveau d'éducation requis, dans l'emploi occupé par les immigrés, est supérieur ou inférieur au niveau d'éducation des travailleurs. Pour identifier ce mauvais appariement entre le niveau d'éducation requis pour l'emploi et celui de l'individu, nous nous basons sur une approche objective : *Realized matched method*. Cette approche statistique identifie les situations de mauvais appariement éducationnel à partir du niveau d'éducation moyen observé pour chacun des emplois.

Concernant l'effet réseau, nous nous basons à la fois sur les liens directs (Calvo-Armengol and Jackson 2004b) comme déterminant lié à la probabilité d'être en situation de mauvais appariement, mais également aux caractéristiques environnementales du lieu de résidence des immigrés (Ioannides and Datcher Loury 2004) pour identifier la contribution de ces facteurs sur la probabilité de trouver un emploi grâce à un intermédiaire. Les variables intégrées concernant l'environnement résidentiel sont relatives à la composition du voisinage (proportion d'immigrés dans l'aire urbaine, niveau d'éducation moyen du voisinage), mais concernent également les caractéristiques économiques du lieu de résidence (pourcentage de personnes en situation de chômage dans l'aire urbaine).

Nous observons que le rôle des intermédiaires contribue à expliquer la probabilité d'être en

situation de sur-éducation ou de sous-éducation. Lorsque nous contrôlons l'effet réseau grâce aux variables relatives à l'environnement social et économique, nous obtenons des résultats hétérogènes concernant l'effet réseau. Pour certains groupes d'immigrés (immigrés diplômés en France et Maghrébins), trouver un emploi grâce à un intermédiaire augmente la probabilité d'être en situation de sur-éducation. A l'inverse, pour les Européens du Sud, le rôle de l'intermédiaire permet de diminuer la probabilité d'être en situation de sur-éducation. En complément, nous obtenons également des résultats nous permettant de caractériser les déterminants contribuant à expliquer la probabilité de trouver un emploi grâce à un intermédiaire. Pour toutes les origines, une variation positive de la proportion d'immigrés dans le voisinage influence positivement le recours à une tierce personne pour trouver un emploi. Indirectement, la variation positive de la proportion du voisinage permet d'influencer soit positivement (pour les Européens du Sud), soit négativement (pour les immigrés diplômés en France et les Maghrébins) l'intégration des immigrés sur le marché du travail à travers la probabilité d'être en situation de sur-éducation.

Les résultats obtenus concernant les situations de sous-éducation sont homogènes selon les différents groupes étudiés. Trouver un emploi grâce à un intermédiaire diminue la probabilité d'être en situation de sous-éducation. Les situations de sous-éducation caractérisent la valorisation de compétences non-éducationnelles sur le marché du travail. Cela signifie que les immigrés mettent en avant des spécificités, acquises ou non dans le pays d'origine, leur permettant d'occuper un emploi pour lequel ils ont un niveau d'éducation inférieur. Dans le même temps, la contribution de la proportion d'immigrés présents dans le voisinage influence positivement la probabilité de trouver un emploi grâce à un intermédiaire. Comme la situation de sur-éducation, la composition sociale du voisinage impacte indirectement la qualité des emplois occupés par les immigrés.

Le principal enseignement de ces travaux réside dans le fait que les réseaux sociaux ont un impact significatif sur l'intégration des immigrés sur le marché du travail. Cet impact se caractérise notamment par une contribution significative à la fois des liens directs mais également en lien avec la composition de l'environnement résidentiel. De ce fait, l'accompagnement des immigrés, lors de l'arrivée dans le pays d'accueil, n'est pas homogène selon l'origine. En termes de politiques publiques, cela implique un traitement différencié selon les besoins individuels des immigrés (maîtrise de la langue, reconnaissance des diplômes acquis dans le pays d'origine) mais également social (notamment en lien avec les choix de localisation des immigrés établis et récemment arrivés). Une concentration trop forte des immigrés au sein de l'espace urbain peut en effet entrainer une ségrégation accrue de ces groupes d'origine, tant d'un point de vue résidentiel que professionnel.

L'intégration des immigrés, sur le long terme impliquera non pas un échec de migration pour un individu mais caractérisera des difficultés d'intégration pour une communauté dans sa globalité.

2. Limites et pistes de recherche

Premièrement, la mesure utilisée dans cette thèse pour caractériser les performances économiques des immigrés ne prend pas en compte les revenus des immigrés. Or, le salaire des immigrés permet de caractériser l'intégration des immigrés sur le marché du travail dans les pays d'accueil en mettant en évidence les différentiels de salaires existants entre les différents groupes selon l'origine des individus d'une part et les natifs d'autres part.

Dans les chapitres 2 et 3, l'analyse de l'effet réseau se focalise seulement sur les immigrés et non sur les générations suivantes. Or, dans le cadre d'une migration permanente, le processus d'intégration des immigrés ne s'arrête pas seulement à la première génération mais se positionne dans un contexte dans lequel les descendants des immigrés peuvent également faire l'objet de discrimination sur le marché du travail. Au-delà de ces discriminations, les interactions sociales, le choix de localisation des parents ainsi que la pression culturelle peuvent impacter les performances économiques des générations suivantes. En prenant en compte les structures spécifiques des réseaux sociaux selon l'origine des immigrés en France, l'analyse de l'effet de l'environnement social des secondes générations d'immigrés permettrait de caractériser à la fois les rendements éducationnels (pour les situations de sur-éducation), mais également la contribution de l'environnement social et économique sur les générations suivantes.

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UNIVERSITE BRETAGNE ECONOMIE LOIRE ET GESTION

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Titre : Intégration et ségrégation des immigrés sur le marché du travail

Mots clés : immigration, réseaux sociaux, marché du travail, cycle économique, inadéquation professionnelle

Résumé : Les questionnements liés à l'intégration des immigrés dans les pays d'accueil se positionnent dans un contexte international caractérisé par une augmentation des flux de population au cours de ces dernières décennies. Les mécanismes identifiés déterminants l'intégration des immigrés sur le marché du travail dépendent à la fois des caractéristiques individuelles, sociales mais également économiques.
A partir de ce constat, nous analysons dans cette thèse le rôle des relations sociales comme déterminant influençant à la fois l'intégration des immigrés sur le marché du travail ainsi que l'inadéquation professionnelle des immigrés.
Concernant le rôle des réseaux sociaux comme moyen de recherche d'emploi, nous analysons, à partir de données françaises, la relation entre l'effet réseau et le cycle économique.
Nos résultats montrent que l'effet réseau est contracyclique. La mobilisation des intermédiaires pour trouver un emploi est plus forte en période de récession économique qu'en période de croissance économique.
Nous prolongeons notre analyse en étudiant la relation entre l'inadéquation professionnelle et l'effet réseau. Au-delà des caractéristiques individuelles pouvant contribuer à expliquer la probabilité d'être en situation de sur/sous-éducation, nous faisons l'hypothèse que trouver un emploi grâce à un intermédiaire influence l'appariement éducationnel entre les immigrés et les emplois occupés. Nous observons un effet ambigu entre le rôle des intermédiaires et l'inadéquation professionnelle selon l'origine des immigrés.

Title : Integration and segregation of immigrants in the labor market

Keywords : immigration, social networks, labor market, business cycle, occupational mismatch

Abstract : The questions related to the integration of immigrants in host countries are positioned in an international context characterized by an increase in population flows in recent decades. The mechanisms determining the integration of immigrants into the labor market depend on individual, social and economic characteristics.
Based on this observation, we analyze in this thesis the role of social relations as a determinant influencing both the integration of immigrants on the labor market and the occupational mismatch of immigrants.
Concerning the role of social networks as a means of job search, we analyze, using French data, the relationship between network effect and economic cycle.
Our results show that the network effect is counter-cyclical. The use of referrals to find a job is stronger during recessions than during expansion periods.
We extend our analysis by studying the relationship between occupational mismatch and the network effect. Beyond individual characteristics that may contribute to explain the probability of being over/undereducated, we hypothesize that finding a job through a referral influences the educational match between immigrants and the jobs held. We observe an ambiguous effect between the role of referrals and occupational mismatch according to the origin of immigrants.