8
Rivista di Economia, Cultura e Ricerca Sociale
Terza Serie
2017 settembre-dicembre

argomenti

all'interno

1506
UNIVERSITÀ DEGLI STUDI DI URBINO CARLO BO

Redazione: Centro studi SISTEMA, Via Sandro Totti, 4 - Edificio 3 - Piano 2, 60131 Ancona (Italy). Tel. 071 286091 / 071 2860925; fax 071 2860928 - e-mail studi@marche.cna.it

Edizione on line: Sebastiano Miccoli

Gli articoli inediti e non sottoposti alla valutazione di altre riviste, devono essere proposti a questa rivista tramite la piattaforma *Open Journal Systems* (OJS) disponibile al sito **http://ojs.uniurb.it/index.php/argomenti/index**, seguendo le indicazioni presenti alla voce "Invia una proposta" e previa registrazione.

Gli articoli pubblicati sulla Rivista *Argomenti* sono sottoposti a rigorosa procedura di *peer review* in modalità 'doppio cieco'. I revisori sono scelti dal direttore scientifico della Rivista, in base a criteri di competenza, tra esperti esterni o tra i membri del Comitato scientifico.

Gli articoli che la rivista pubblica sono presenti nei seguenti registri di catalogazione: Catalogo italiano dei periodici/Acnp, DOAJ Directory Open Access Journals, Ebsco Discovery Service, Essper, Google Scholar, RePEc (Research Paper in Economics).

Argomenti. Rivista di economia, cultura e ricerca sociale è una pubblicazione dell'Università di Urbino realizzata in collaborazione con la CNA MARCHE.

Questa rivista utilizza Open Journal Systems 2.4.8.0, che è un software open source per la gestione e pubblicazioni di riviste elettroniche. Lo sviluppo e la manutenzione di questa installazione di OJS sono forniti da UniURB Open Journals, gestito dal Servizio Sistema Bibliotecario di Ateneo. E-ISSN 1971-8357 (Online)**.** Registrazione presso il Tribunale di Urbino n. 4/2015 – Direttore responsabile Sergio Giacchi.

III quadrimestre 2017 - Finito di stampare nel mese di dicembre 2017

Ambito di interesse

Argomenti intende coprire uno spazio di discussione a sostegno dell'innovazione della piccola impresa e dei sistemi locali intesi come cardine dello sviluppo italiano ed europeo. La rivista cercherà di dare strumenti alla progettualità e alle concrete capacità di intervento sul territorio impostando analisi empiriche e formulazioni teoriche non fini a se stesse né chiuse in astratte formalizzazioni riservate a pochi interlocutori specializzati, ma sempre inerenti alle problematiche del governo del territorio e alle condizioni per il suo sviluppo. L'intento è di caratterizzare la nuova serie di *Argomenti* secondo caratteri di interdisciplinarietà dell'analisi, utilizzando e mettendo a confronto approcci differenti oltre che esperienze di ricerca diverse per ambito e metodologia.

La rivista si rivolge perciò innanzitutto ai soggetti economici (imprenditori e forze del lavoro), agli studiosi e ai policy maker ai vari livelli. Per le tematiche affrontate e gli orientamenti divulgativi si propone come un utile strumento di studio e approfondimento per studenti e ricercatori che vogliano approfondire le problematiche relative allo sviluppo economico territoriale.

Sommario

Reti d'impresa ambientali e innovazione: un'applicazione per l'Italia

di Giulio Guarini, Giuseppe Garofalo, Arianna Moschetti*

Riassunto

Gli autori illustrano, in linea con un approccio evolutivo-schumpeteriano, l'importanza delle innovazioni ambientali per una crescita economica sostenibile e, in questo ambito, dei networks tra PMI. Nella parte empirica, dopo aver descritto statisticamente le reti d'impresa ambientali in Italia, stimano econometricamente il loro impatto sulla produttività delle singole imprese partecipanti.
Parole chiave: reti d'impresa ambientali, produttività del lavoro
Classificazione Jel: L14; L25; O32; O44; Q01; Q55

Environmental Networks and Firm's Innovation: an Application for Italy

Abstract

Following an evolutionary-schumpeterian approach, the authors illustrate the importance of environmental innovations for sustainable economic growth and, in this context, of SME networks. In the empirical section, after describing them with reference to Italian situation, they econometrically estimate their impact on the productivity of the individual participating companies.
Keywords: environmental networks, labour productivity.
Jel classification: L14; L25; O32; O44; Q01; Q55.

*Dipartimento di Economia, Ingegneria, Società e Impresa, Università degli studi della Tuscia, via del Paradiso 47, 01100, Viterbo, Italia. *Corresponding author*: giulioguarini@unitus.it. L'articolo è uno dei frutti del progetto di ricerca su "Le reti d'impresa come volano per la diffusione di innovazioni", finanziato dall'ENEA. Alla ricerca hanno contribuito Luca Correani e Silvia Pugliesi. Si ringrazia il referee anonimo per le preziose indicazioni. Gli autori restano gli unici responsabili di eventuali errori ed inesattezze.

Introduzione

Il contratto di rete, una forma di aggregazione (introdotta nella legislazione italiana nel 2009) più flessibile e innovativa rispetto alle tradizionali, consente lo sfruttamento di sinergie e complementarità aggregative senza rinunciare alla propria autonomia gestionale. Tutto ciò rappresenta un utile strumento per superare i limiti legati al ridotto profilo dimensionale delle PMI, in particolare i vincoli connessi alla carenza di competenze specialistiche e quelli di natura finanziaria che possono limitare gli investimenti.

Negli ultimi sei anni il numero delle reti d'impresa che in Italia hanno espressamente indicato come obiettivo strategico il miglioramento dell'efficienza energetica e la sostenibilità ambientale è cresciuto progressivamente raggiungendo i 147 contratti (il 6% del totale) con il coinvolgimento di 724 imprese[1]. Le imprese italiane hanno cominciato a comprendere l'importanza di una filiera integrata tra le aziende impegnate sulle diverse progettualità green, in modo da distribuire in modo ottimale compiti, processi e funzioni, massimizzando i benefici ottenibili.

Obiettivo del nostro studio è quello di analizzare il ruolo delle reti d'impresa ambientali nei processi di innovazione, un tema che prescinde, a nostro avviso, dal contesto specifico, assumendo un rilievo generale. Nella parte teorica, si evidenzia l'importanza delle innovazioni ambientali per una crescita economica sostenibile. Successivamente si descrivono i drivers delle innovazioni ambientali, focalizzando l'attenzione sul networking. In tal senso si enucleano le caratteristiche che rendono le reti ambientali un efficace strumento di innovazione, date le forti complementarità tra tecnologie standard e tecnologie pulite e, in generale, tra innovazioni standard ed ambientali. Il networking, anche se valido per ogni tipo di innovazione perché foriero di economie di scala, è estremamente importante per le innovazioni ambientali che si caratterizzano per una maggiore complessità dovuta alla molteplicità di soggetti coinvolti e di competenze richieste. Dal livello macroeconomico ci spostiamo su quello microeconomico mostrando come, a livello di singola impresa, si richieda l'*open eco-innovation mode*, ossia una strategia di apertura alla conoscenza esterna. Esso prevede appunto come primo pilastro l'*external knowledge sourcing* che si basa sulla partecipazione a network che siano "larghi" (*network breadth*) per attrarre le competenze necessarie non possedute e, allo stesso tempo, "profondi e solidi" (*network depth*) per ridurre quelle differenze che frenano lo scambio di idee, progetti, esperienze, saperi. Inoltre la trasmissione e

[1] I dati aggiornati a maggio 2016 sono tratti da Infocamere.

l'implementazione di conoscenze esterne, indispensabile per innescare o sostenere processi innovativi "verdi" richiede l'*absorptive capacity*, ossia una rilevante attività di R&S per favorire l'apprendimento di nuova conoscenza esterna, e *social integration mechanisms* per facilitarne la diffusione informale (aspetto molto studiato nella letteratura sui distretti) e per rendere l'organizzazione interna capace di adattarsi ai cambiamenti che il networking richiede.

Nella sezione empirica partiamo dalla costruzione di un dataset che, combinando dati Infocamere con il database AIDA (Analisi Informatizzata delle Aziende Italiane) - Bureau van Dijk, dispone di un set informativo comprensivo di dati economico-finanziari di 442 imprese firmatarie di un contratto di rete ambientale. Successivamente stimiamo un modello *system GMM* per mostrare come la numerosità dei legami interni alle reti ambientali d'impresa possa avere un significativo impatto positivo sulla produttività dell'impresa. Tale risultato esprime la complementarità tra innovazioni ambientali ed innovazioni standard che è un *technology push driver* dell'innovazione ambientale. I risultati dimostrano come l'implementazione di pratiche "verdi" non solo sia compatibile con le strategie di business, ma possa rappresentare un'opportunità di crescita aziendale. In linea con la *Porter' hypothesis* strumenti normativi ben congegnati per le esigenze del mondo imprenditoriale, quali sono i contratti di rete, possono essere efficaci nel migliorare le performance aziendali. Più in particolare dimostriamo, in linea con altri studi empirici sui networks (Ghisetti et al. 2015), come vi sia, dopo un iniziale effetto positivo, un'inversione dovuta a diseconomie di scala. La fase iniziale in cui il networking ha un impatto positivo sulla produttività è però di gran lunga superiore alla fase finale in cui si ha un'eccessiva crescita dei costi di gestione per l'assorbimento e la valorizzazione della nuova conoscenza esterna. Tale aspetto aggiunge un ulteriore elemento di complessità al networking legato all'ambiente e pone all'attenzione del sistema istituzionale e del sistema produttivo l'importanza dell'*absorptive capacity* per limitare tale fenomeno.

1. Il framework teorico

Lo sviluppo sostenibile ha come componenti imprescindibili non solo la capacità di innovare prodotti e cicli produttivi, ma lo sviluppo e la messa in pratica delle eco innovazioni o innovazioni ambientali. Quest'ultime si distinguono dalle innovazioni tradizionali perché tengono conto sia del profilo economico, che di quello sociale e ambientale in cui vengono realizzate.

In riferimento ad un approccio di tipo schumpeteriano, in generale le innovazioni possono essere classificate in cinque tipologie:

«(1) l'introduzione di nuovi beni e servizi o di nuove qualità di beni e servizi; (2) lo sviluppo di nuovi metodi di produzione o di nuove strategie di marketing; (3) l'apertura di nuovi mercati; (4) la scoperta di nuove fonti di materie prime o un nuovo utilizzo di risorse già conosciute; (5) la costituzione di nuove strutture industriali in un dato settore» (Ocampo 2005).

Nello specifico le innovazioni ambientali, secondo una prospettiva evolutiva-schumpeteriana, sono così definite:

«the production, assimilation or exploitation of a product, production process, service or management or business methods that is novel to the organization (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives» (Kemp and Pearson, 2007, p. 7).

Le innovazioni ambientali possono essere di prodotto, organizzative e di processo. Quest'ultime si dividono in due tipologie. Le prime sono tecnologie *end-of-pipe* che riducono l'inquinamento inserendo degli apparati tecnici al termine del processo produttivo (come ad esempio filtri, apparecchiature di desolforazione); del secondo tipo sono le tecnologie *cleaner production* che riducono l'inquinamento trasformando il processo produttivo, ad esempio ottimizzando l'utilizzo di materie prime e combustibili e il dosaggio di materiale chimico (Oltra, 2008; Hammer and Lofgren, 2010).

1.1 Innovazioni ambientali e crescita sostenibile

Le innovazioni ambientali sono molto importanti per la sostenibilità, che può essere misurata mediante la riduzione del volume delle emissioni di gas inquinanti (H). L'indicatore di sostenibilità può essere definito come il prodotto tra il PIL (Y) e l'intensità ambientale (H/Y), come mostra la seguente identità

$$H = Y\frac{H}{Y}. \quad (1.1)$$

L'intensità ambientale può essere vista come l'inverso dell'efficienza ambientale Y/H e quest'ultima è utilizzata come proxy delle innovazioni ambientali, in analogia all'impiego della produttività del lavoro come indicatore delle innovazioni "standard". L'efficientamento energetico, definito come la riduzione del rapporto tra energia (E) e PIL (Y), contribuisce alla diminuzione dell'intensità ambientale, come mostra la seguente identità

$$(1.2)\quad \frac{H}{Y} = \frac{H}{E}\frac{E}{Y}.$$

La (1.1) e la (1.2) permettono di comprendere in modo chiaro il senso del quadro programmatico dell'Unione Europea per il settennio 2014-2020 intitolato "Europa 2020", che mira a promuovere e sostenere una crescita che sia inclusiva, innovativa e sostenibile. Dalla (1.1) emerge come la strada per una crescita sostenibile passi inevitabilmente per l'innovazione, perché è possibile aumentare *Y* ed avere una riduzione di *H* solamente tramite un decremento di *H/Y*. La (1.2) mostra come sia importante non solo risparmiare energia, ma anche incrementare la quota delle energie rinnovabili che, rispetto alle altre fonti energetiche, sono meno inquinanti, ossia hanno un minore rapporto $\frac{H}{E}$. La strategia Europa 2020 associa la sostenibilità all'innovazione attraverso l'attivazione di iniziative "green" di politica industriale, che permettano al sistema produttivo europeo di intraprendere sentieri di crescita che coniughino il miglioramento della qualità della vita con il miglioramento della competitività per affrontare le sfide della globalizzazione. Per questo sono stati individuati dei targets, in riferimento alle emissioni di gas inquinanti, allo sviluppo delle energie rinnovabili e alla promozione della Ricerca & Sviluppo (Word Economic Forum, 2014).

1.2 Reti d'impresa e innovazioni

Il contratto di rete di impresa, introdotto nell'ordinamento giuridico italiano a partire dal 2009[2], costituisce una nuova forma organizzativa snella e flessibile capace di superare il radicamento territoriale e migliorare la circolazione dell'informazione, la diffusione della conoscenza e la generazione dell'innovazione, agevolando così collaborazioni tra imprese anche distanti.

In senso economico, i contratti di rete, di per sé un'innovazione di tipo normativo, sono innovazioni di processo, in quanto modificano le varie attività inerenti il processo produttivo delle imprese partecipanti, attraverso lo scambio di informazioni e/o prestazioni di natura industriale, commerciale, tecnica o tecnologica. A sua volta, tale cooperazione diviene motore di altre innovazioni, attraverso la generazione di economie di scala statiche e dinamiche: le prime legate principalmente alla condivisione di centri di costo, le seconde invece frutto di processi di apprendimento e trasferimento di conoscenza.

[2] A livello europeo l'incentivo all'aggregazioni tra micro, piccole e medie imprese, al cui interno si colloca anche il "contratto di rete", è previsto già da tempo dai programmi comunitari attraverso lo Small Business Act" per l'Europa del 2008.

Altri elementi che determinano economie di scala statiche sono le *indivisibilità*, per cui la produzione di alcuni beni necessita di una scala minima di produzione e l'aumento dell'output può avvenire solo in dimensioni multiple rispetto a tale livello. Legato ad esso vi è l'effetto soglia che riguarda un costo fisso (di impresa, di settore, di area) che, superato un certo livello, ricade in modo decrescente su ogni unità prodotta.

Tali fenomeni attengono a situazioni in cui, per motivi tecnologici, organizzativi, istituzionali, esistono discontinuità nella produzione, ossia si ha un investimento fisso minimo con capacità ottima data. All'interno della stessa impresa, superato il livello ottimo, si hanno rendimenti di scala crescenti mentre, all'interno di uno stesso settore industriale, l'impresa che produce al di sotto di tale livello ha costi più alti dell'impresa che produce al di sopra. Tale investimento può riguardare: a livello di impresa, una tecnologia, laboratori specializzati, attività che si avvantaggino della vicinanza dei clienti e fornitori; a livello settoriale, regionale e sovraregionale, infrastrutture pubbliche, consorzi privati utili alle attività produttive e finanziabili in base alla dimensione di tali attività (telecomunicazioni, strade, produzione elettrica, depurazione…). Logicamente esiste anche un livello di saturazione, oltre il quale emergono diseconomie dovute principalmente a problemi di tipo organizzativo.

Un fenomeno che genera economie di scala dinamiche è quello del *learning by doing* ossia di apprendimento dovuto alla produzione cumulata e al tempo trascorso a produrre lo stesso bene. Altri due fenomeni concernenti le economie di scala dinamiche sono il *learning by using*, secondo cui il prolungato utilizzo di una tecnologia permette di conoscerla in modo dettagliato e di sfruttarne sempre meglio i vantaggi, e le *network externalities* secondo le quali, con il passare del tempo e con l'aumentare del numero delle imprese che adottano tale tecnologia, cresce il vantaggio economico perché si riducono i costi di utilizzo. Tali *network externalities*, centrali dal nostro punto di vista, sono collegate alle economie di agglomerazione, concernenti principalmente la riduzione dei costi di trasporto e di transazione, e alle economie si scopo (o di specializzazione). relative alla divisione orizzontale del lavoro (Arthur, 1994; Fajnzjbler 1990).

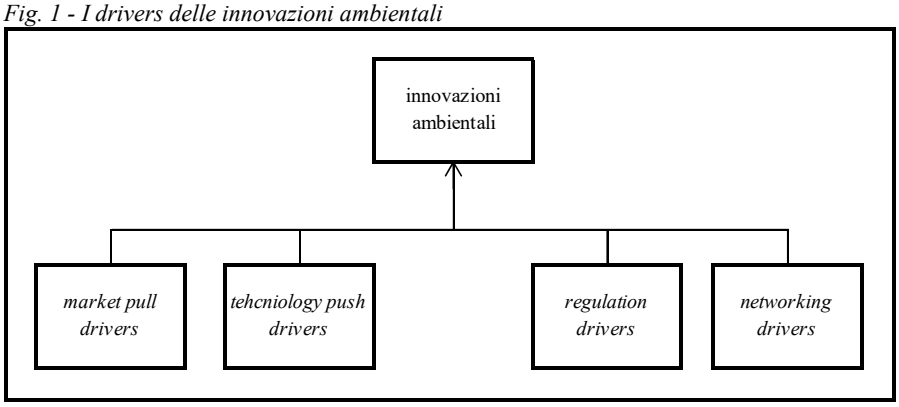
Lo stretto legame tra reti d'impresa e innovazione emerge come fenomeno dinamico: l'interazione tra diversi attori con diverse competenze e qualifiche aiuta a creare nuova conoscenza e quindi innovazioni, specialmente come risultato della complementarità tra i diversi saperi (Foray e Lissoni, 2010). La prolungata e intensa interazione favorisce il trasferimento non solo di conoscenza *codificata*, che è prodotta e trasmessa secondo canali formali, ma anche di conoscenza *tacita*, prodotta e trasmessa in via informale (Johnson e Lundvall 1994; Lundvall, Johnson, Andersen e Da-

lum 2002). Quindi, le innovazioni sono dei processi di interazione tra agenti non omogenei, diversi tipi di conoscenza e diverse competenze, elementi presenti nelle reti di impresa dove si ha collaborazione tra aziende tra di loro eterogenee. Un ulteriore elemento di eterogeneità può derivare dal diverso contesto territoriale in cui operano le imprese, in quanto le reti, a differenza delle realtà distrettuali, possono essere interprovinciali e interregionali.

1.3 I drivers delle innovazioni ambientali

I drivers delle innovazioni ambientali sono fondamentalmente di quattro tipi: *market-pull, technology-push, regulation e network* (Rennings 2000; Nemet 2009; Ghisetti et al. 2015).

Fig. 1 - I drivers delle innovazioni ambientali



Market-pull drivers. L'aumentato interesse da parte dei cittadini per le questioni ecologiche provoca una nuova domanda di prodotti eco-compatibili, che stimola la capacità innovativa rivolta alla creazione di nuovi prodotti. In tale ambito è possibile definire una Green Engel law (Guarini et al. 2016) secondo cui, con l'aumento del reddito, cambia la struttura dei consumi che si orienta verso beni e servizi finali e intermedi più sostenibili. I prodotti "verdi" possono essere considerati dei beni di "lusso" nel senso che la loro domanda cresce più che proporzionalmente rispetto alla crescita del reddito (ossia essi hanno un'elasticità al reddito maggiore di uno). Poiché i beni e servizi "verdi" hanno spesso un prezzo più alto rispetto a quelli "standard", è fondamentale il marketing ambientale e strumenti di certificazione ambientale che evidenzino ai consumatori i benefici in termini di qualità ambientale, che possono più che compensare la maggiorazione del prezzo (Florida 1996; Popp et al. 2007). In

quest'ottica la Commissione europea ha lanciato l'iniziativa "Closing the Loop. An EU action plan for the circular economy" (Commissione europea 2015) per promuovere proposte legislative a livello nazionale e regionale atte ad implementare la cosiddetta "economia circolare" dove "the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised". La pressione dei consumatori, tramite campagne di sensibilizzazione e/o di protesta, e delle istituzioni, attraverso ad esempio acquisti mirati, può influenzare in modo significativo il processo di adozione e diffusione delle eco-innovazioni da parte delle imprese (Taylor et al. 2006). L'Europa sostiene lo sviluppo delle eco-industrie[3], considerate il motore non solo del consumo sostenibile, ma anche della produzione sostenibile, visto che esse offrono importanti beni intermedi e servizi alle imprese, per il miglioramento in senso ecologico della produzione.

Technology-push effects. Grazie alla complementarità tra le diverse tecnologie, un approccio integrato alle innovazioni può condurre alla nascita di eco-innovazioni combinando opportunamente Ricerca & Sviluppo, modelli di management, pratiche organizzative e processi di meccanizzazione (Ziegler and Rennings,2004; Rennings et al., 2006; Wagner, 2007; Rehfeld et al., 2007; Ziegler and Nogareda, 2009). Infatti, il rapporto tra innovazioni ambientali e "standard" è molto stretto: in letteratura vari studi empirici si occupano di testare "l'efficiencies complementarity" (Guarini 2015) ossia l'interazione positiva tra la dinamica della produttività del lavoro e quella dell'efficienza ambientale. La principale spiegazione di tale fenomeno riguarda la dual externality (detta anche double externalities) secondo cui le eco-innovazioni producono un duplice effetto: da una parte riducono l'inquinamento che è una esternalità negativa e dall'altra determinano esternalità positive generando nuova conoscenza che è un bene pubblico (Johnstone et al., 2010). Questi spillover ambientali nascono soprattutto nell'ambito delle attività di Ricerca & Sviluppo e possono riguardare non solo le imprese, ma anche territori provinciali, regionali e, in ultimo, uno Stato (Jaffe et al., 2003; Rennings, 2000). La complementarità può derivare anche dalle economie di scala: infatti, come le innovazioni standard, anche quelle ambientali sono caratterizzate da processi di apprendimento, competenze tecnologiche e cumulatività del processo di sviluppo delle tecnologie

[3] Secondo l' "Action Plan for sustainable consumption and production and sustainable industrial policy of European Commission", si definiscono eco-industrie «small and innovative companies operating in the renewable energy, waste recycling, environmental auditing and consultancy, and capital intensive firms providing good and services in specific areas, e.g. waste, wastewater, transport».

(Horbach, 2008). Inoltre esistono le economie di scopo tra tecnologie "pulite" e quelle "normali" (Johnstone et al., 2008). I nuovi macchinari sostituiscono quelli vecchi portando non solo maggiore qualità ambientale, attraverso il rispetto delle normative in materia, ma anche una maggiore produttività del lavoro. In sostanza, una maggiore intensità di capitale può comportare miglioramenti non solo quantitativi, ma anche qualitativi. Infine le innovazioni normali di tipo organizzativo sono spesso legate alle innovazioni ambientali le quali, coinvolgendo molti elementi della produzione, necessitano anche di un sostegno da parte del management (Horbach et al., 2012). Grazie alla loro stretta interazione positiva, i due tipi di innovazioni sono parti di un'unica strategia e, talvolta, sono difficilmente scindibili (Collins e Harris 2005).

Regulation effects. Le innovazioni ambientali possono nascere come reazione positiva alla regolamentazione ambientale. Il rispetto degli standard ambientali può divenire occasione di cambiamento del processo produttivo aziendale, offrendo nuove opportunità di sviluppo, precedentemente non considerate. Tale meccanismo diviene virtuoso quando nel medio-lungo periodo gli iniziali costi di adeguamento alla norma sono più che bilanciati dai benefici di un processo innovativo "verde" (Beise and Rennings, 2005). Questa meccanismo virtuoso è affermato dalla Porter' hypothesis (Porter e Van der Linde, 1995) per cui un'efficace politica ambientale stimola il risparmio dei costi, rendendo i processi produttivi non solo più "puliti", ma anche più efficienti nel medio-lungo periodo. I policy makers possono offrire o domandare informazioni utili per le eco-innovazioni che, altrimenti, le imprese non produrrebbero, né adotterebbero, perché l'informazione è un bene pubblico. Infine poiché la fase iniziale si caratterizza principalmente per i costi di ottemperanza alla norma, vale il principio del "first mover advantages" ossia l'impresa che per prima si adegua alla nuova regolamentazione ottiene un vantaggio competitivo, perché, prima delle altre, inizierà a godere dei benefici netti del processo innovativo che scaturiscono dal rispetto della norma (Jaffe et al., 2003).

Networking drivers. Abbiamo già ricordato come i networks siano fondamentali per i processi di innovazione perché producono economie di scala sia statiche che dinamiche: il networking assume un ruolo più importante nelle innovazioni ambientali rispetto a quelle standard (Horbach et al. 2013). Di solito i networks ambientali sono maggiormente qualificati rispetto a quelli "standard", data la maggiore presenza di soggetti esterni al mondo dell'impresa di alto profilo, quali Università ed enti di ricerca. Ciò è dovuto al fatto che la conoscenza richiesta per l'implementazione di tecnologie "pulite" è complessa e "codificata" (Cainelli et al., 2012). Grazie a ciò, secondo vari studi empirici (ad esempio De Marchi, 2012), nelle reti

ambientali la cooperazione per l'innovazione sembra più efficace soprattutto nell'ambito della Ricerca&Sviluppo, agevolando il trasferimento di conoscenza (De Marchi and Grandinetti, 2013). I processi di innovazione ambientale richiedono alle imprese significativi cambiamenti in varie direzioni che il networking può aiutare a gestire in modo opportuno. Tali cambiamenti riguardano: le scelte tecniche e gli aspetti ingegneristici della produzione (design dimension) (Braungart et al., 2007); l'interazione con il mercato per soddisfare i consumatori nelle fasi di identificazione, creazione e sviluppo dell'innovazione ambientale (users involvment); i rapporti con le imprese a monte e a valle del proprio processo produttivo, in una prospettiva supply chain (product service dimension); la governance intesa sia come gestione manageriale dell'innovazione all'interno dell'impresa, vista la pervasività delle innovazioni ambientali, sia come gestione dei rapporti con le istituzioni locali e nazionali (governance dimension) (Unruh, 2000).

In sintesi, secondo la letteratura i networks ambientali, rispetto a quelli standard, sono più eterogenei, maggiormente selettivi, per le specifiche competenze richieste ai partecipanti, più efficaci, maggiormente incentrati sulle knowledge interactions e, soprattutto, più determinanti per il processo innovativo delle imprese.

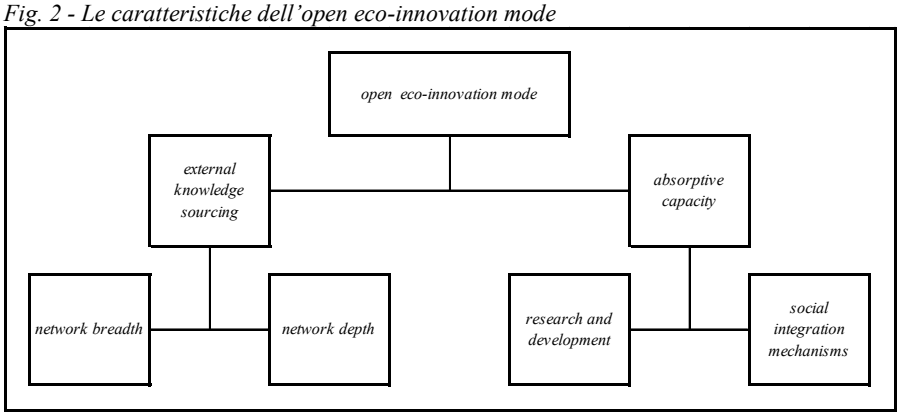
1.4 Il networking e l'open eco-innovation mode

Si è illustrato come il networking sia un importante driver delle innovazioni ambientali. Il modello innovativo che pone il networking in una posizione rilevante all'interno della strategia aziendale è il cosiddetto *open eco-innovation mode* (Ghisetti et al. 2015, Chesbrough 2003; Chesbrough et al., 2006), il cui elemento basilare è l'*external knowledge sourcing*: tale attività è svolta principalmente tramite il networking che, per essere efficace, deve coinvolgere reti "larghe" (*network breadth*) e "profonde" (*network depth*).

La *network breadth* aiuta l'impresa ad affrontare due aspetti peculiari delle innovazioni ambientali: la loro natura sistemica e le finalità multiple ad esse legate. Secondo il primo aspetto, per implementare o sviluppare tali innovazioni sono necessarie competenze multidisciplinari. Infatti, bisogna incrementare la dotazione di competenze in ambito tecnico-scientifico (in relazione agli aspetti inquinanti del processo produttivo), legislativo (in riferimento alla normativa nazionale e internazionale da rispettare), manageriale (gestione della complessità dei fattori e dei soggetti coinvolti) ed economico (trasformare vincoli ambientali in opportunità di business). Maggiore è il numero di soggetti esterni con cui si collabora, e più è probabile sopperire alla mancanza di qualche specifica competenza. Gli obiettivi che

si intendono perseguire grazie all'implementazione di tecniche e/o tecnologie "verdi" sono plurimi, riguardando sia l'efficienza della produzione, sia la qualità del prodotto secondo le richieste del mercato e/o gli standard normativi. In tale ambito, una cooperazione esterna "allargata" favorisce il raggiungimento di molteplici obiettivi, eliminando eventuali *trade-off* e sfruttando possibili economie di scopo.

Fig. 2 - Le caratteristiche dell'open eco-innovation mode



L'altro aspetto importante, si è detto, è la *network depth*. Le reti se da una parte devono essere "larghe", dall'altra devono stabilire legami solidi e profondi. Una cooperazione tra soggetti diversi se per un verso aiuta a trasferire competenze non presenti all'interno dell'impresa, per un altro comporta, inevitabilmente, una certa difficoltà di comunicazione e comprensione: tali problemi possono essere attenuati dalla solidità e stabilità del rapporto posto in essere. Reti solide possono superare il *cognitive gap*, che è appunto il lato negativo delle reti larghe. Inoltre legami durevoli generano il processo di *learning by interacting*, nel senso che il prolungarsi della collaborazione fa acquisire ai partecipanti quelle *relationals skills* che migliorano la capacità di trasferimento e apprendimento della conoscenza esterna.

Secondo alcuni studi (Laursen and Salter, 2006; Simon, 1947; Koput, 1997; Ocasio, 1997) l'impatto positivo della network breadth e network depth ha un andamento parabolico (*the inverted U-shape breadth and depth effects*). Dopo un certo livello, l'attività di knowledge sourcing può incidere negativamente sulle performance aziendali a causa di diseconomie di scala: le reti possono raggiungere una dimensione "eccessiva" e divenire troppo complesse generando elevati costi di management e uno "spiazzamento" di tempo e risorse rispetto ad altri processi innovativi standard.

Il secondo pillar dell'open eco-innovation mode è l'*absorptive capacity* definita come «the ability of a firm to recognize the value of new, external

information, assimilate it, and apply it to commercial ends» (Cohen and Levinthal, 1990, p.128).

La trasmissione della conoscenza esterna richiede notevoli sforzi nella fase di apprendimento, utilizzo e valorizzazione della conoscenza esterna. L'investimento aziendale in Ricerca&Sviluppo migliora tale capacità, perché rende più intelligibile una conoscenza esterna che, nel caso delle innovazioni ambientali, è soprattutto codificata e complessa, riducendo la *cognitive distance* con partner particolarmente competenti in ambito ambientale (Cohen and Levinthal 1989, 1990). Lo stesso dicasi per la promozione del capitale umano di cui l'azienda può disporre per questo tipo di attività (Abramovitz 1986, 1994). Tali investimenti aziendali in "conoscenza interna" possono rappresentare un volano per innovazioni standard complementari alle innovazioni ambientali. Un altro elemento chiave per l'absorptive capacity è l'insieme dei cosiddetti *social integrations mechanisms*, che sviluppano capacità organizzative e rendono la struttura produttiva flessibile e adattabile nella fase di assorbimento della conoscenza esterna, migliorando la diffusione e la circolazione di tale conoscenza tra le divisioni aziendali e rafforzando i canali (formali e informali) di trasmissione (Zahra e George, 2002).

L'interazione tra l'external knowledge sourcing e l'absorptive capacity diviene il fulcro non solo dello sviluppo dell'open eco-innovation mode a livello di impresa, ma anche di sistemi di innovazione regionali e nazionali (Castellacci e Natera, 2013; Fabrizi et al. 2016).

2. Analisi empirica

L'analisi empirica è articolata in due sezioni. La prima, un esame statistico-descrittivo, rappresenta una sorta di "mappatura" a livello territoriale e settoriale delle imprese aderenti a reti ambientali. Successivamente, tramite la realizzazione di un dataset ad hoc che incorpora anche microdati economico-finanziari, stimiamo un *system GMM*. Dall'analisi econometrica emerge l'importanza dell'estensione territoriale delle reti ambientali e la numerosità dei legami tra imprese al fine di migliorare le performance aziendali, suggererendo interessanti spunti di riflessione.

2.1 Analisi descrittiva

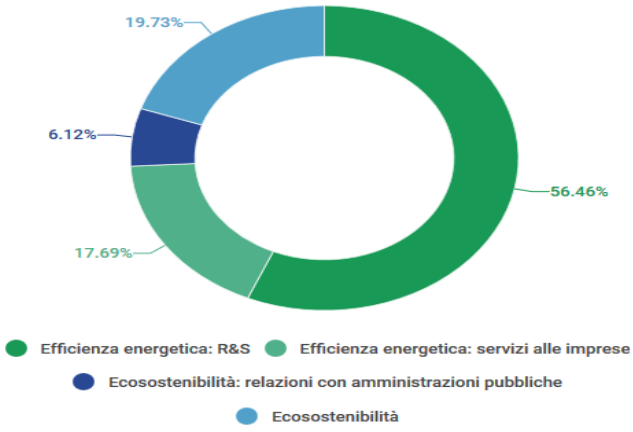
Le reti ambientali sono contratti di rete che hanno come obiettivo strategico il miglioramento dell'efficienza energetica e la sostenibilità ambientale.

Attraverso i dati Infocamere (un registro telematico delle imprese aderenti alle Camere di commercio) sono state individuate 147 reti ambientali che coinvolgono 724 imprese, perlopiù costituite tra il 2011 e il 2013, con un ritmo di crescita di oltre il 50% annuo.

L'identificazione delle reti ambientali è stata effettuata attraverso l'utizzo di *keywords*[4] riconosciute nell'oggetto dei 2536 contratti esaminati. Successivamente, le reti selezionate sono state suddivise in categorie in base alla propria mission:

- 109 reti, per un totale di 545 imprese, che hanno indicato espressamente l'efficienza energetica nella propria *mission*; di queste, la maggior parte (83) sono reti proiettate a realizzare innovazioni di prodotto e/o processo, le restanti (26) forniscono servizi integrati di consulenza alle imprese in tema di risparmio energetico;
- 38 reti, per un totale di 183 imprese, che hanno indicato espressamente l'ecosostenibilità del territorio, intesa come misure di riduzione dell'impatto ambientale, bonifica, recupero e riciclo; di queste alcune (9) sono reti di imprese che lavorano attivamente con le amministrazioni e enti locali.

Fig. 3 - Obiettivi strategici delle reti ambientali

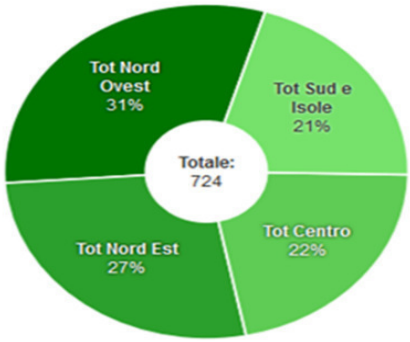


Fonte: Ns. Elaborazioni su dati Infocamere.

[4] Le *keywords* impiegate nell'identificazione delle reti ambientali sono: efficienza energetica, efficientamento energetico, risparmio energetico, riqualificazione energetica, sostenibilità ambientale, ecosostenibilità, impatto ambientale e *green*.

Le 724 imprese aderenti a reti ambientali sono localizzate in gran parte nel Nord Italia (il 58%), in particolare nelle regioni Lombardia (194 imprese), Emilia Romagna (93), Veneto (64) e Toscana (61); il restante 42% è suddiviso equamente tra il Centro e il Sud.

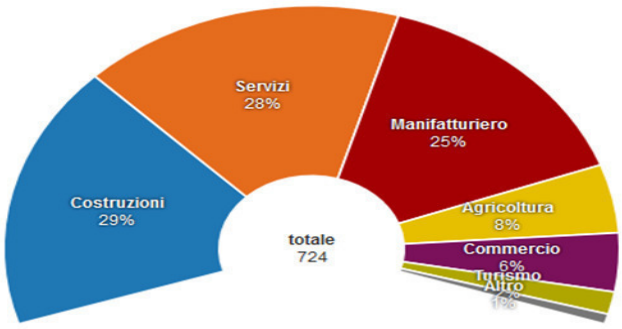
Fig. 4 - Area geografica delle imprese in reti ambientali



Fonte: Ns. Elaborazioni su dati Infocamere.

Relativamente al settore di attività, molte delle imprese considerate, analogamente alla conformazione nazionale, operano nel settore dei servizi (28%) e nel manifatturiero (25%). Spicca la presenza del comparto edilizio con il 29% delle imprese, mentre si rivela una minore presenza del settore agricolo, del commercio e del turismo.

Fig. 5 - Settori di attività delle imprese in rete



Fonte: Ns. Elaborazioni su dati Infocamere.

Infine, se consideriamo la dimensione delle imprese si riscontra un ridotto profilo dimensionale, tipico delle PMI italiane, con l' 83,3% del campione composto da micro e piccole imprese, ovvero con meno di 49 dipendenti, mentre le grandi imprese, con oltre 250 addetti, costituiscono solamente il 4,8% del campione.

2.2 Analisi econometrica

Obiettivo di questa sezione è quello di stimare l'effetto sulla produttività aziendale dell'adesione ad un contratto di rete, con riferimento specifico ad imprese operanti in ambito ambientale.

2.2.1 Il dataset

Dopo aver individuato dai dati pubblicati da Infocamere, in base alla mission del contatto, 147 reti ambientali con il coinvolgimento di 724 imprese (per oltre la metà costituite sotto forma di società di capitali, relativamente alle imprese tenute all'obbligo di depositare il bilancio), abbiamo ricostruito con l'ausilio del database AIDA (Analisi Informatizzata delle Aziende Italiane - Bureau van Dijk) i dati economico-finanziari di 442 imprese firmatarie di un contratto di rete ambientale, in un arco temporale che va dal 2009 al 2015. In tal modo è stato possibile costruire un dataset che ha come osservazione la singola impresa coinvolta in una (o più) reti ambientali.

2.2.2 La stima

Il modello stimato è un *system* GMM (Roodman, 2006), ed è rappresentato dalla seguente equazione:

$$PROD_{jt} = \gamma_0 + \gamma_1 PROD_{jt-1} + \gamma_2 (K/L)_{jt} + \gamma_3 LINK_{jt} - \gamma_4 LINK_{jt}^2 + \gamma_i \sum_k^n anno_{ij} + \mu_j$$

dove $PROD_{jt}$ è il logaritmo della produttività del lavoro, calcolata come rapporto tra il valore aggiunto (in migliaia di euro) e il numero dei dipendenti, $(K/L)_{jt}$ è il logaritmo dell'intensità di capitale, $LINK_{jt}$ è un indice

che misura il totale dei collegamenti, ossia il numero di imprese partners della rete ambientale e di tutte le altre reti in cui l'impresa è coinvolta.

Più in particolare l'indice *LINK*, associando ad ogni impresa del campione un valore che è pari alla somma algebrica del numero di imprese con le quali è venuta in contatto grazie alla stipula di uno o più contratti di rete ambientale, fornisce una *proxy* dell'ampiezza del *network* potenziale per ogni impresa. La variabile $LINK_{jt}$ ingloba sia l'effetto del networking ambientale, sia quello del networking standard, sia infine l'impatto della loro interazione. Essa è inserita anche al quadrato, per tener conto di un andamento parabolico. Quest'ultimo è dovuto ad un iniziale effetto positivo legato allo sfruttamento di possibili economie di scala o di scopo legate all'adesione alla rete ambientale, ed a un successivo effetto negativo sulle performance aziendali quando il network generato dalla partecipazione ad una o più reti supera un livello "critico" diventando troppo complesso e oneroso. Come sottolineano Ghisetti et al. (2015), alcuni studi teorici ed empirici (Laursen and Salter, 2006; Simon, 1947; Koput, 1997; Ocasio, 1997) pongono in evidenza il fatto che l'attività di *broad e deep knowledge sourcing* dopo una certa dimensione, può sottrarre energie, risorse e "attenzione" all'attività principale; nel caso di innovazioni ambientali, viste la varietà e la complessità delle informazioni e competenze richieste all'esterno, tale fenomeno di rendimenti decrescenti appare ancora più significativo.

Il parametro γ_0 e $\sum_k^n anno_{ij}$ rappresentano, rispettivamente, la costante e la sommatoria delle dummy temporali. Infine μ_j è il residuo che tiene conto degli effetti individuali ed è robusto all'eteroschedasticità e all'autocorrelazione, per migliorare la specificazione del modello.

Inoltre si introduce la variabile $PROD_{jt-1}$ ritardata per tener conto del fenomeno della *technological path dependence*[5]. Il system GMM model permette di tener conto della potenziale endogeneità dei regressori.

La produttività del lavoro ritardata e l'intensità di capitale hanno coefficienti positivi e significativi, indicando, rispettivamente, la cumulatività delle innovazioni e l'importanza della tecnologia incorporata nei macchinari. La variabile network ha un impatto significativo con andamento parabolico. Come si mostra in appendice (Tabella A.2), il rendimento di tale fattore ha il suo massimo nel punto 14,97 che è all'interno dell'intervallo di confidenza compreso tra 12,15 e 17,79. I risultati sono robusti e significativi grazie ad un campione composto da oltre 1350 osservazioni e al fatto che si tiene conto dell'effetto specifico di ogni impresa e dell'effetto annuale.

[5] In appendice (Tabella A.1) si presentano le statistiche descrittive.

Tab.1 - I risultati econometrici

GMM system	(1)	(2)	(3)
$PROD_{jt-1}$	0.2817***	0.2244***	0.1689*
	(0.0845)	(0.0816)	(0.0914)
$(K/L)_{jt}$	0.1772***	0.1651***	0.2376***
	(0.0428)	(0.0462)	(0.0690)
$LINK_{jt}$		0.0194*	0.2148**
		(0.0119)	(0.0980)
${LINK^2}_{jt}$			-0.0072**
			(0.0035)
costante	2.1306***	2.4200***	1.5335***
	(0.2940)	(0.2903)	(0.5386)
Osservazioni	1356	1356	1356
AR (1)	(-3.08)***	(-2.99)***	(-2.62)***
AR (2)	(-1.12)	(-1.21)	(-1.26)
Hansen test	(29.54)	(30.29)	(36.00)
F test per anni	(21.54)***	(21.37)***	(22.70)***

Nella regressione, in parentesi si riporta la standard deviation, mentre nei test in parentesi se ne riporta il valore; *p-value=0.10, **p-value=0.05, ***p-value=0.001.

Riflessioni conclusive

L'analisi svolta ha messo in luce aspetti teorici ed empirici utili a promuovere l'implementazione di reti d'impresa ambientali come promotori dell'innovazione. Inizialmente si sono individuati i driver delle innovazioni ambientali. Queste ultime possono essere stimolate, dal lato della domanda, grazie ad una maggiore sensibilità alle questioni ambientali da parte dei consumatori e delle istituzioni e, dal lato dell'offerta, sfruttando le forti complementarità esistenti tra tecnologie standard e tecnologie pulite e, in generale, tra innovazioni standard e ambientali. In questo processo le istituzioni possono avere un ruolo di stimolo attraverso politiche di regolamentazione ambientali pro-business che pongano le imprese in condizione di trasformare un vincolo normativo legato al rispetto dell'ambiente in un'opportunità di sviluppo aziendale. Il networking, anche se valido per ogni tipo di innovazione perché responsabile di economie di scala, è estremamente importante per le innovazioni ambientali che si caratterizzano per una maggiore complessità dovuta alla molteplicità di soggetti coinvolti e di

competenze richieste. A livello di singola impresa, il modello innovativo richiesto è l'open eco-innovation mode, ossia una strategia di apertura alla conoscenza esterna. Esso prevede appunto come primo pilastro l'*external knowledge sourcing* che si basa sulla partecipazione a network "larghi" (*network breadth*) per attrarre le competenze necessarie non possedute e, allo stesso tempo, "profondi e solidi" (*network depth*) per ridurre quelle differenze che frenano lo scambio di idee, progetti, esperienze, saperi. Ma la trasmissione e l'implementazione di conoscenze esterne, indispensabile per innescare o sostenere processi innovativi "verdi", richiede l'*absorptive capacity*, ossia una rilevante attività di Ricerca&Sviluppo, per favorire l'apprendimento di nuova conoscenza esterna, e *social integration mechanisms* per facilitare la diffusione informale di conoscenza (aspetto molto studiato ad esempio nell'esperienza dei distretti) e per rendere l'organizzazione interna capace di adattarsi ai cambiamenti che il networking richiede.

Nella sezione empirica, il system GMM model ha mostrato come la numerosità dei legami tra imprese possa avere un significativo impatto positivo sulla produttività dell'impresa che vi appartiene. Tale impatto ha un rendimento positivo ma decrescente che per valori elevati dei due indici diviene negativo manifestando diseconomie di scala, come confermato anche in altri studi empirici sui network.

Riferimenti bibliografici

Abramovitz, M. (1986). Catching-up, forging ahead and falling behind. *Journal of Economic History*, vol. 46, 385–406. Doi: 10.1017/S0022050700046209.

Abramovitz, M. (1994). The origins of the postwar catch-up and convergence boom in Fagerberg, J., Verspagen, B., von Tunzelmann, N. (Eds.)., *The Dynamics of Technology, Trade and Growth*. Edward Elgar, Aldershot. Doi: 10.1017/S0022050700046209.

Arthur, B. (1994). *Increasing returns and path dependence in the economy*, University of Michigan Press, Ann Arbor. Doi: 10.3998/mpub.10029.

Barzotto, M., Corò, G., & Volpe, M. (2014). Apertura internazionale e risorse economiche locali. Un'indagine sul radicamento territoriale di imprese multinazionali. Argomenti, vol. 42, 31-53. Doi: 10.3280/ARG2014-042002.

Beise, M., Rennings, K. (2005). Lead markets and regulation: a framework for analyzing the international diffusion of environmental innovations. *Ecological Economics,* vol.52 n.1, 5–17. Doi: 10.1016/j.ecolecon.2004.06.007.

Braungart, M., McDonough, W., Bollinger, A. (2007). A cradle-to-cradle design, creat-ing healthy emissions: a strategy for eco-effective product and system design. *Journal of Cleaner Production,* vol.15 n.13–14, 1337–1348. Doi: 10.1016/j.jclepro.2006.08.003.

Cainelli, G., Mazzanti, M., Montresor, S. (2012). Environmental innovations. Local networks and internationalization. *Industry and Innovation,* vol.19 n.8, 697–734. Doi: 10.1080/13662716.2012.739782.

Carrillo-Hermosilla, J., Del Río, P., Könnölä, T. (2010). Diversity of eco-innovations: Reflections from selected case studies. *Journal of Cleaner Production*, n. 18, 1073-1083. Doi: 10.1016/j.jclepro.2010.02.014.

Castellacci, F., Natera, J. M. (2013). The dynamics of national innovation systems: A panel cointegration analysis of the coevolution between innovative capability and absorptive capacity. *Research Policy*, Elsevier, vol. 42 (3), 79-594. Doi: 10.1016/j.respol.2012.10.006.

Chesbrough, H. (2003). *Open Innovation: The New Imperative for Creating and Prof-iting from Technology,* Harvard Business Press, USA.

Chesbrough, H., Vanhaverbeke,W., West, J. (2006). *Open Innovation: Researching a New Paradigm,* Oxford University Press, USA.

Cohen, W.M., Levinthal, D.A. (1989). Innovation and Learning: The Two Faces of R&D, *Economic Journal*, 99(397), 569-596. Doi: 10.2307/2233763.

Cohen, W.M., Levinthal, D.A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, vol. 35, n. 1, Special Issue: Technology, Organizations, and Innovation, 128-152. Doi: 10.2307/2393553.

Collins, A., Harris, R. (2005). The Impact of Foreign Ownership and Efficiency on Pollution Abatement Expenditures by Chemical Plants: Some UK Evidence. *Scottish Journal of Political Economy*, vol. 52 n. 5, 747-768. Doi: 10.1111/j.1467-9485.2005.00365.

Commissione europea (2015). *Closing the loop – An EU action plan for the circular economy*, COM (2015). 614 final, Bruxelles.

De Marchi, V. (2012). Environmental innovation and R&D cooperation: empirical evidence from Spanish manufacturing firms. *Research Policy*, vol.41 n.3, 614–623. Doi: 10.1016/j.respol.2011.10.002.

De Marchi, V., Grandinetti, R. (2013). Knowledge strategies for environmental innovations: the case of Italian manufacturing firms. *Journal of Knowledge Management,* vol. 17 n.4, 569–582. Doi: 10.1108/JKM-03-2013-0121.

Fabrizi, A., Guarini, G., Meliciani, V. (2016). Public Knowledge Partnerships in European Research Projects and Knowledge Creation Across R&D Institutional Sectors. *Technology Analysis & Strategic Management*. Doi: 10.1080/09537325.2016.1181741.

Fadda, S. (2016). Labour coefficients reduction and working time reduction. *Argomenti*, (4), 67-87. Doi: 10.14276/1971-8357.557.

Fajnzjbler, F. (1990). Industrialization in Latin America: From the Black Box to the Empty Box. *Cuadernos de la CEPAL,* n.60, 1-172.

Florida, R. (1996). Lean and green: the move to environmentally conscious manufac-turing. *California Management Review,* 39 (1), 80–105. **Doi**: 10.2307/41165877.

Foray, D., Lissoni, F. (2010). *University Research and Public–Private Interaction* in Handbook of the Economics of Innovation, Vol. 1, Chapter 6, Elsevier B.V. Doi: 10.1016/S0169-7218(10)01006-3.

Ghisetti, C., Marzucchi, A., Montresor, S. (2015). The open eco-innovation mode. An empirical investigation of eleven European countries. *Research Policy,* n.44 1080–1093. Doi: 10.1016/j.respol.2014.12.001.

Guarascio, D., Fana, M., & Cirillo, V. (2017). La crisi e le riforme del mercato del lavoro in Italia: un'analisi regionale del Jobs Act. *Argomenti*, (5), 29-56. Doi: 10.14276/1971-8357.573.

Guarini, G. (2015). Complementarity between environmental efficiency and labour productivity in a cumulative growth process. *PSL Quarterly Review*, vol. 68 n. 272, 41-56.

Guarini, G., Garofalo, G., Federici A. (2016). Innovative, Inclusive and Eco-Sustainable Growth in Europe: A Structuralist-Keynesian Approach. *Rivista di politica economica*, in attesa di pubblicazione.

Hammer, H., Lofgren, A. (2010). Explaining Adoption of End of Pipe Solutions and Clean Technologies – Determinants of Firms' Investments for Reducing Emissions to Air in Four Sectors in Sweden. *Energy Policy*, vol. 38 n. 7, 3644-3651. Doi: 10.1016/j.enpol.2010.02.041.

Horbach, J. (2008). Determinants of Environmental Innovation – New Evidence from German Panel Data Sources. *Research Policy,* vol.37, 163-173. Doi: 10.1016/j.respol.2007.08.006.

Horbach, J., Rammer, C., Rennings, K. (2012). Determinants of Eco-innovations by Type of Environmental Impact - The Role of Regulatory Push/Pull, Technology Push and Market Pull. *Ecological Economics,* vol.78 112-122. Doi: 10.1016/j.ecolecon.2012.04.005.

Horbach, J., Oltra, V., Belin, J. (2013). Determinants and specificities of eco-innovations. An econometric analysis for the French and German Industry based on the Community Innovation. Survey *Industry and Innovation,* vol.20 n.6 523–543. Doi: 10.1080/13662716.2013.833375.

Jaffe, A., Newell, R., Stavins, R. (2003). Technological Change and the Environment, in Maler K.G. and Vincent J.R. (eds.). *Handbook of Environmental Economics*, Amsterdam, Elsevier.

Johnson, B. Lundvall, B. (1994). The Learning Economy *Journal of Industry Studies*, vol. 1(2), 23–42. Doi: 10.1080/13662719400000002.

Johnstone, N., Hascic, I., Kalamova, M. (2010). Environmental Policy Characteristics and Technological Innovation. *Economia Politica*, vol. 27 n. 2, 275-299.

Johnstone, N., Labonne, J., Thevenot, C. (2008). Environmental Policy and Economies of Scope in Facility-Level Environmental Practices. *Environmental Economics and Policy Studies*, vol. 9 n. 3, 145-166. Doi: 10.1007 /BF03353987.

Kemp, R., Pearson, P. (2007). Final Report MEI Project about Measuring Ecoinnovation (MEI). UM-MERIT, Maastricht.

Koput, K.W. (1997). A chaotic model of innovative search: some answers, many questions. *Organization Science*, vol.8 n.5 528–542. Doi: 10.1287/orsc.8.5.528.

Laursen, K., Salter, A. (2006). Open for innovation: the role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal*, n.27, 131–150. Doi: 10.1002/smj.507.

Lucchese, M., Nascia, L., & Pianta, M. (2016). Una politica industriale e tecnologica per l'Italia. *Argomenti,* (4), 25-50, Doi: 10.14276/1971-8357.568.

Lundvall, B.A., Johnson, B., Andersen, E.S., Dalum, B. (2002). National systems of production, innovation and competence building. *Research Policy*, vol. 31, 213–231. Doi: 10.1016/S0048-7333(01)00137-8.

Marra, C., & Turcio, S. (2016). Insider e outsider nel mercato del lavoro italiano. *Argomenti*, (4), 89-134. Doi: 10.14276/1971-8357.524.

Nemet, G. (2009). Demand-pull, technology-push, and government-led incentives fornon-incremental technical change. *Research Policy,* 38 (5), 700–709. Doi: 10.1016/j.respol.2009.01.004.

Ocampo, J. (2005). *Beyond Reforms Structural Dynamics and Macroeconomic Vulnerability*. Stanford University Press. Doi: 10.1596/0-8213-5819-7.

Ocasio, W. (1997). Towards an attention-based view of the firm. *Strategic Management Journal,* vol.18 n.1, 187–206.

Oltra, V. (2008). Environmental Innovation and Industrial Dynamics: The Contributions of Evolutionary Economics. *Cahiers du GREThA*, n. 2008-28, University of Bordeaux, pubblicato in http://cahiersdugretha.u-bordeaux4.fr/2008/2008-28.pdf.

Popp, D., Hafner, T., Johnstone, N. (2007). Policy vs. Consumer Pressure: Innovation and Diffusion of Alternative Bleaching Technologies in the Pulp Industry. NBER Working Papers, n.13439, National Bureau of Economic Research Inc. Doi: 10.3386/w13439.

Porter, M., Van Der Linde, C. (1995). Toward a new conception of the environment–competitiveness relationship. *Journal of Economic Perspectives,* vol. 9 n. 4, 97–118. Doi: 10.1257/jep.9.4.97.

Rehfeld, K.M., Rennings, K., Ziegler, A. (2007). Integrated product policy and environmental product innovations: an empirical analysis. *Ecological Economics,* vol.61 n.1, 91–100.

Rennings, K. (2000). Redefining Innovation – Eco-Innovation Research and the Contribution from Ecological Economics, *Ecological Economics*, vol. 32 n. 2, 319-332. Doi: 10.1016/S0921-8009(99)00112-3

Rennings, K., Ziegler, A., Ankele, K., Hoffmann, E. (2006). The influence of different characteristics of the EU environmental management and auditing schemeon technical environmental innovations and economic performance, *Ecological Economics,* vol. 57 n.1, 45–59. Doi: 10.1016/j.ecolecon.2005.03.013.

Roodman, D. (2006). How to do xtabond2: an introduction to Difference and System GMM in Stata. *Center for Global Development, Working Paper* n. 103. Doi: 10.2139/ssrn.982943.

Simon, H.A. (1947). *Administrative Behavior*. Free Press, New York. Doi: 10.1017/S0034670500047082

Taylor, M.R., Rubin, E.S., Nemet, G.F. (2006). The Role of Technological Innovation in Meeting California's Greenhouse Gas Emission Targets Cap.III in Hanemann, M. and A.Farrell (eds.). *Managing Greenhouse Gases in California*, Report prepared for the Energy Foundation and the Hewlett Foundation.

Unruh, G.C. (2000). Understanding carbon lock-in. *Energy Policy,* vol.28 817–830. Doi: 10.1016/ S0301-4215(00)00070-7.

Wagner, M. (2007). On the relationship between environmental management, environmental innovation and patenting: evidence from German manufacturing firms. *Research Policy,* vol.36, n.10, 1587–1602. Doi: 10.1016/j.respol.2007.08.004.

Word Economic Forum (2014). *The Europe 2020 Competitiveness Report: Building a More Competitive Europe*, pubblicato in www.weforum.org/Europe2020.

Zahra, S.A., George, G. (2002). Absorptive capacity: a review, reconceptualization andextension. *Academy of Management Review,* vol. 27, n.2, 185–203. Doi:10.5465/AMR.2002.6587995.

Ziegler, A., Nogareda, S.J. (2009). Environmental management systems and techno-logical environmental innovations: exploring the causal relationship. *Research Policy,* vol.38, n.5, 885–893. Doi:10.1016/j.respol.2009.01.020.

Ziegler, A., Rennings, K. (2004). Determinants of environ-mental innovations in Germany: do organizational measures matter? A Discrete Choice Analysis at the Firm Level. ZEW Discussion Paper, 04-30 2004.

Appendice

Tabella A.1 - Equazione: statistiche descrittive

Variabile		Media	Std. Dev.	Min.	Max.	Osservazioni
$PROD_{jt}$	overall	3.922735	0.7237857	0.8931577	7.290.958	N = 2329
	between		0.6899546	0.4311329	6.063.871	n = 402
	within		0.4568233	0.189126	7.158.211	T-bar = 5.79353
$PROD_{jt-1}$	overall	3.922612	0.7240844	0.8931577	7.290.958	N = 2327
	between		0.6899718	0.4311329	6.063.871	n = 402
	within		0.4570081	0.1890026	7.158.088	T-bar = 5.78856
$(K/L)_{jt}$	overall	3.70243	1.683967	-5.495.485	8.773.639	N = 2388
	between		1.576805	-2.899.248	7.990.142	n = 402
	within		0.7203239	-1.645.346	7.299.894	T-bar = 5.9403
$LINK_{jt}$	overall	8.968109	8.374025	1	38	N = 4390
	between		8.382624	1	38	n = 439
	within		0	8.968109	8.968109	T = 10
${LINK^2}_{jt}$	overall	150.5353	263.5569	1	1444	N = 4390
	between		263.8275	1	1444	n = 439
	within		0	150.5353	150.5353	T = 10

Tabella A.2 - Equazione: analisi della parabola

Range di $LINK_{jt}$	[1.38]
$(LINK_{jt} + {LINK_{jt}}^2)$ ha il massimo in *argext*	14.9716
Standard error di *argext* (delta method)	1.43887
Intervallo di confidenza di *argext* (95%)	(12.15147, 17.79174)

Acculturation and Ethnic Hybridism in Immigrant Entrepreneurship

di Alessandro Arrighetti*, Daniela Bolzani** e Andrea Lasagni***

Abstract

Received literature describes ethnic firms as founded to meet the needs of an ethnic community and use peculiar configurations of human and social capital drawing on ethnic resources. According to some authors, this is due to the "acculturation lag" that characterizes immigrant entrepreneurs retaining traditional values from the heritage culture. Recent evidence however shows that immigrant firms are undergoing significant changes in their organizational structures, such as the incorporation of native or non-co-ethnic partners or employees (i.e., firm ethnic hybridism). This study analyzes whether these changes are accompanied by different entrepreneurs' acculturation patterns. A unique set of primary data about 130 first-generation immigrant entrepreneurs in Italy is used to shed some new light on this topic and suggest avenues for future research.

JEL Classification: L26; F22; Z1.

Keywords: Immigrant entrepreneurship; Acculturation; Ethnic hybridism; Multicultural hybridism; Team diversity; Italy.

Acculturazione ed ibridazione etnica nell'imprenditoria immigrata

Sommario

Le imprese etniche sono descritte nella letteratura come imprese orientate ai bisogni della comunità etnica di riferimento e organizzate sulla base di risorse etniche. Secondo alcuni autori, questo è spiegato dal "ritardo acculturativo" che caratterizza gli imprenditori immigrati che mantengono i valori tradizionali della cultura di origine. Tuttavia, studi recenti mostrano che le imprese di immigrati si stanno modificando dal punto di vista organizzativo, per esempio incorporando soci o dipendenti non co-etnici (i.e., ibridismo etnico). Questa ricerca analizza se tali cambiamenti sono accompagnati da diversi orientamenti di acculturazione negli imprenditori, basandosi su dati primari raccolti da 130 imprenditori stranieri di prima generazione, suggerendo possibilità per future ricerche.

Classificazione JEL: L26; F22; Z1.

Parole Chiave: Imprenditori immigrati; Acculturazione; Ibridismo etnico; Ibridismo multiculturale; Diversità del team imprenditoriale; Italia

* Professore ordinario, Dipartimento di Scienze Economiche e Aziendali, Università degli Studi di Parma, Via Kennedy 6, Parma, e-mail alessandro.arrighetti@unipr.it

** Ricercatrice, Facoltà di Economia, Università Cattolica del Sacro Cuore, Via Necchi 5, Milano, e-mail daniela.bolzani@unicatt.it

*** Professore associato, Dipartimento di Scienze Economiche e Aziendali, Università degli Studi di Parma, Via Kennedy 6, Parma, e-mail alessandro.arrighetti@unipr.it

Introduction

Most of the literature on ethnic businesses emphasizes a marked difference between immigrant and native firm (Rath, 2000). According to the literature, the differences between the two types of business stems from the fact that the formers are founded to meet the needs of a certain ethnic community, display and use a particular configurations of human and social capital drawing on their ethnic group, which influences their entrepreneurial behaviors and business activities (e.g., Chaganti & Greene, 2002; Ndofor & Priem, 2011; Shin & Han, 1990). An important factor that has been highlighted in extant literature about ethnic entrepreneurship is what Light and Bonacich (1988) have called "acculturation lag", indicating the retention of traditionalist values from the heritage culture. Such acculturation lag characterizes immigrant entrepreneurs in maintaining an extended kinship network, which provides a low-cost, dedicated, and flexible workforce to ethnic businesses (Barrett et al., 1996; Ram & Jones, 2008).

However, recent empirical studies have shown that, in the last decade, significant changes have been shaping different organizational forms and composition of relationships in immigrant businesses (Barberis, 2008; Portes et al., 2002; Sahin et al., 2014). In particular, while a large share of immigrant entrepreneurs still reflect conventional patterns of strong economic and social connection with the origin community, another, relatively large proportion of firms seems to be moving away from the traditional model to adopt another one, which implies redefining the organizational structure of the firm, often starting a size growth process and incorporating in the firm indigenous or non-co-ethnic partners or employees (*firm ethnic hybridism*). While these organizational changes have been somehow highlighted (Arrighetti et al., 2014a), to date it is not clear whether they are as well accompanied by shifts in the acculturation orientations of immigrant entrepreneurs. In this paper, we shed light on this issue by tackling the following research question: do entrepreneurs operating in companies characterized by different levels of ethnic hybridism display different acculturation patterns?

We analyse unique primary data collected from 130 first-generation immigrant entrepreneurs in Italy using face-to-face interviews, based on a structured questionnaire. Our sample is composed of an heterogeneous group of firms that cater both enclave and mainstream markets, and are characterized by different levels of ethnic hybridism.

In the following, we revise extant literature on ethnic entrepreneurship and acculturation, we describe our research design and methodology, illustrate findings and discuss them along with highlighting some conclusive remarks.

1.Theoretical background

1.1 Perspectives on ethnic entrepreneurship

Traditionally, ethnic entrepreneurship has been defined as «»a set of connections and regular patterns of interaction among people «sharing common national background or migration experiences» (Waldinger et al., p. 3). The literature has shown that ethnic entrepreneurs, who trade on ethnic markets drawing on ethnic exchanges, are able to protect their businesses from the entry of non-ethnic competitors who do not have easy access to the cultural and information resources that characterize the single community. Asymmetry in the knowledge of community members' preferences, obstacles associated with language barriers and the absence of interpersonal links significantly disadvantage potential non-co-ethnic entrants (Brenner et al., 2010; Portes & Zhou, 1992). As well as the reduction of competitive pressure, the embeddedness of the firm in its ethnic community offers selective information, privileged funding sources, and relatively low-cost and flexible manpower. Even in models of immigrant entrepreneurship which emphasize the role of the economic and institutional environment where the enterprise operates (see, for example, the mixed embeddedness hypothesis Kloosterman & Rath, 2001), the mobilization of resources and ethnic relations represent a source of strategic advantage of an immigrant firm.

However, the enclave market, in addition to generating “protected” business opportunities, also defines the boundaries of an economic space that the ethnic firm has difficulty to overcome (Portes & Shafer, 2006; Ward, 1987). The organizational model adopted, the nature of the services and products offered, and the lack of managerial resources make ethnic businesses difficult to compete in mainstream markets (Masurel et al., 2002; Portes & Sensenbrenner, 1993). Consequently, for a long while, ethnic businesses have been reported in the literature as being smaller and less successful than mainstream businesses (Butler & Greene, 1997; Menzies et al., 2007; Rusinovic, 2008; Walton-Roberts & Hiebert, 1997). This has also led to the understanding that businesses belonging to a given

ethnic community are very similar to each other, and, at the same time, they tend to be very different from non-ethnic firms.

As an explanation to this phenomenon, following Light and Bonacich (1998), several authors have acknowledged that an "acculturation lag" plays an active part of the genesis and management of ethnic businesses, in particular for first-generation immigrants. Specifically, studies highlight that the interplay between the traditional values that immigrants are supposed to have brought with them or have taught to their descendants in the host country, and the modern urban values of the receiving society, may lead immigrants to evaluate and exploit entrepreneurial opportunities differently from native entrepreneurs (Barret et al., 1999). This has been explained by several hypotheses. First, immigrants coming from a more deprived economic context are prepared to exploit opportunities that are not attractive to native entrepreneurs as inadequately rewarded, since these opportunities can be more relatively satisfying to them (Light, 1984). Second, maintaining a heritage culture gives rise to a different approach to business engagement than native business owners, such as the willingness to work unsocial hours and rapidly expanding in «commercially hostile inner-city environments abandoned by native white businesses» (Barrett et al., 1999, p. 790). Third, retaining heritage culture also refers to maintaining traditional institutions, such as the patriarchal extended-kinship network, which provides pooled savings and flexible, cheap, loyal and compliant manpower, thus resulting supportive of a small business lifestyle (Bonacich, 1973; Bonacich & Modell, 1980; Light, 1972).

Nevertheless, in the last few decades, significant changes have been observed that make the enterprises owned by immigrant entrepreneurs less consistent with the model just described. Several authors provided evidence of a growing variety of immigrant enterprises, a modification of their organizational models and an evolution towards activities outside of enclave economies (e.g., Engelen, 2001; Guercini et al., 2017a; Ram & Hillin, 1994; Waldinger et al., 1990). The phenomenon affects both low-skilled and high-skilled ethnic entrepreneurs (Kloosterman & Rath, 2010). It is explained by the increasing demand of labor-intensive services (Hettlage, 2008; Sassen, 2001), but also by the growing claim for technical, financial, legal and administrative advisory services originating from local firms (Ram, 2003; Wang & Altinay, 2012).

Four specific modifications of the traditional ethnic business model have been highlighted and studied by extant literature. First, the growing industrial articulation of immigrant-managed activities and their efforts made to link ethnic goods and services to non-ethnic consumers and

markets (Waldinger, 2000). Immigrant entrepreneurs not only continue to target underserved retail markets, low-economies-of-scale and reduced-entry-barriers industries, and protected markets of ethnic goods addressed to migrant communities; but they also target handicraft production, manufacturing, as well as retail and catering for non-ethnic consumers (Kloosterman & Rath, 2010; Ram et al., 2017). Second, the engagement into international business activities, not only limited to transnational commercial relationships with the country of origin and to traditional retailing, low-value added sectors (e.g., Bolzani, 2013; Brzozowski et al., 2014). In this regard, mixed embeddedness characterizes immigrant-owned enterprises in maintaining different ethnic or business networks both in the home and in the host country, which provide access to different resources (e.g., market information; finance; supply) (e.g., Guercini et al., 2017b). Third, the growing differentiation of roles within ethnic companies, with explicit orientation towards division of labor and specialization of managerial tasks. Even within the same industry, as Ambrosini (2005) pointed out, there is a growing differentiation among the firms where well-established entrepreneurs expand their activity until assuming the role of wholesalers for the most recently established companies or intermediaries for supply chain management in the building industry. Fourth, an increased diversity of managerial models and the adoption of relatively complex organizational formulas by a segment of immigrant entrepreneurs (Arrighetti et al., 2014a; Baycan-Levent et al., 2004), which increase the variety of experience realized and show a markedly heterogeneous evolutionary dynamics.

These changes suggest the need to revise the interpretation of the ethnic enterprise as a uniform organization, with homogeneous structures, business models, and similar evolutionary strategies, reinforcing the view that Deakins (1999) defines as the *pluriformity* of ethnic entrepreneurship. In particular, these changes disclose: on the one hand, a) the remodeling of relationships with the origin community and the host context with a relative decrease of the centrality of the former in favor of the latter and, on the other, b) the loss of the distinctive features of the traditional ethnic firm and its diversity vis-à-vis the indigenous firm.

As a result of diversification and entering into non-enclave markets, immigrant entrepreneurs can rely less on exclusive co-ethnic resources and need to reconsider the role of family community assets.

In this new context, the co-ethnic community continues to play a support to the ethnic business, but its role is reappraised and no longer plays a vital role in providing information, reporting opportunities and ensuring a minimum level of demand for products or services (Arrighetti

et al., 2014a; Barrett et al., 1996). This function is at least partly replaced by increasing investments in building relationships with other non-co-ethnic or native business owners, with the formal institutions representing economic interests and with native professional counselors (Amin, 1995; Arrighetti et al., 2014b). In other words, exploiting new market opportunities requires to establish interactions with actors owning specific resources, within and outside local community (Barberis & Violante, 2017; Guercini et al., 2017a; Milanesi et al., 2016).

In this sense new evidence on the organizational structures of the ethnic enterprise are being showing that, as the organizational complexity and the variety of strategies are growing, the firm is also open to individuals (customers, suppliers, members, employees) coming from communities other than those of origin of the entrepreneur. The search of information and managerial inputs, other than those owned by single entrepreneurs, has encouraged the firm to incorporate non-co-ethnic people as partners or employees. In this regard, Mushaben (2006) shows that a non-negligible proportion (17%) of Turkish companies operating in Germany has hired German employees. Leung (2001) reports the presence of collaborative links between Chinese and native entrepreneurs in France. Arrighetti, Bolzani and Lasagni (2014a and b) point out that, in a sample of ethnic businesses located in Emilia Romagna, a third has experienced long-term relationships with non-co-ethnic individuals as a partner or employee. Confirming the feasibility of ethnic hybridism models, Arrighetti, Foresti, Fumagalli and Lasagni (2017) provide evidence that firms having non-co-ethnic members in the board show better business performance during the Great Recession (2008-2016) than firms with only native partners. Based on these recent contributions, we have to agree with Pecoud (2005) when he states that emphasizing the ethnic component of immigrant entrepreneurship fails to recognize how porous the boundaries between ethnic and non-ethnic firm are.

The birth of businesses characterized by ethnic hybridism is explained by changes in the perspectives of the immigrant entrepreneur, but also by new needs that arise for the indigenous entrepreneur. As stressed in Guercini, Dei Ottati, Baldassar and Johanson (2017), because of globalization, native entrepreneurship can also lose centrality and become peripheral in foreign markets. Especially when management resources are scarce, as is often the case in small businesses, native entrepreneurs may experience liabilities of outsidership. In this context the need to integrate their skills with partners who have knowledge and relationships in distant markets is a relevant incentive for the birth of ethnically hybrid organizations.

The emergence of immigrant businesses that significantly diverge from the traditional model of the ethnic firm and are able to exploit the host country's professional and managerial resources, which are embodied by non-co-ethnic founding partners and employees (Altinay, 2008; Altinay & Altinay, 2006; Mushaben, 2006), leads to an innovative organizational configuration that we term "ethnic hybridism" within the firm (see Arrighetti et al., 2014a and 2014b). In ethnic hybrid firms, the evaluation of opportunities, the decision-making and the carrying out of tasks partly continue to depend on ethnic and community resources, but increasingly rely on social and economic ties developed within the indigenous community. Ethnic and native resources are blended into the firm, which allow for a better understanding of new markets' dynamics, link markets located in different countries and enhance its internal efficiency (Arrighetti et al., 2014a).

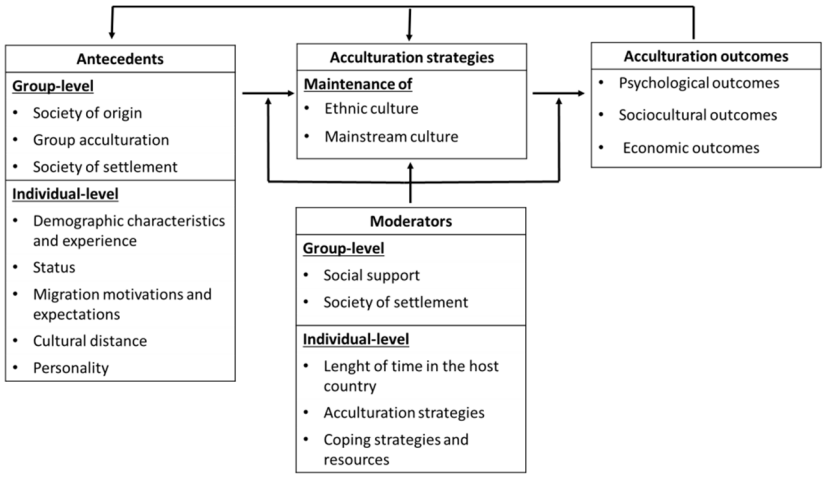
To date, whereas the organizational and firm-level aspects of ethnically hybrid firms have been studied, the very individual-level nature of acculturation strategies maintained by the entrepreneurs operating in these firms towards their ethnic culture or the host culture has not been explored. In this paper we therefore aim to investigate whether the acculturation lag that has been described by previous studies as characterizing ethnic businesses is still preserved in ethnically hybrid firms; or whether, contrarily, patterns of acculturation to the host context are more enhanced in these firms with respect to non- ethnically hybrid firms.

1.2 Acculturation

Acculturation theory finds its origins in anthropology (Berry, 2001) and has been used in sociological studies and extensively developed in cross-cultural psychology. In this paper, we will specifically draw on a cross-cultural psychological approach to acculturation, as we are interested in the effects of acculturation on the behaviors of immigrant entrepreneurs in the host country. The term acculturation refers to «those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact with subsequent changes in the original culture patterns of either or both groups» (Redfield et al., 1936, p. 149). Whereas the term acculturation can be used as a neutral term to account for change taking place in either or both groups, in practice it often refers to change in one of the groups – i.e., the acculturating group (Berry, 1990; 1997).

The concept of acculturation can be understood both at the collective level, referring to a change in the culture of a certain group; or at the individual level, regarding to a change in the psychology of the individual (Graves, 1967). In this paper, we refer to the individual-level concept of acculturation, i.e., psychological acculturation (Berry, 1997) which generates individual behavioral and psychological changes (Berry et al., 1987; Selmer & De Leon, 1996). These changes can be regarded as adaptation to different environmental conditions, and regard psychological aspects (e.g., psychological distress, personal and cultural identity, mental health, personal satisfaction in the new cultural context); sociocultural aspects both with regard to the ethnic culture and the host culture (e.g., interactions with co-nationals or hosts, ability to deal with daily problems related to family life, work, or school); and economic aspects (e.g., finding a job, work satisfaction) (Arends-Tóth & Van de Vijver, 2006; Aycan & Berry, 1996; Searle & Ward, 1990).

Fig. 1 – Process model of acculturation



Source: our elaboration based on Çelenk & Van de Vijver (2014) and Berry (1997).

Previous literature has shown that acculturation outcomes are reached through a process, as shown in Figure 1, that is influenced by antecedent and moderation factors (e.g., Berry, 1997; Arends-Tóth & Van de Vijver, 2006). The antecedent factors refer to group-level and individual-level factors. Group-level factors include the characteristics of the host society (e.g., discrimination and integration policies; Bourhis et al., 1997; multicultural ideology; Berry & Kalin, 1995), of the society of origin

(e.g., political context, economic situation, and demographic factors; cultural distance; Berry, 1997) and of the immigrant group (e.g., physical, biological, economic, social, and cultural differences with respect to the host society; Berry, 1997). At the individual-level, antecedents can be found in demographic variables (e.g., age, gender, education; e.g., Beiser et al., 1988), status (e.g., Aycan & Berry, 1996), migration motivations and expectations (e.g., Richmond, 1993), cultural distance towards the host society (e.g., Ward & Searle, 1991), and personality (e.g., extraversion and openness; Matsumoto et al., 2007; Van der Zee & Van Oudenhoven, 2000). The acculturation process is also influenced by moderating variables intervening during acculturation, both referred to group-level conditions (e.g., social support from the ethnic community; mainstream society attitudes towards immigrants), and individual-level factors (e.g., length of time in the host country; acculturation strategies; coping strategies and resources) (Berry, 1997).

Immigrants employ different acculturation strategies (or orientations) to deal with the ethnic and mainstream culture[1]. Early studies on acculturation held that immigrants follow a path of adjustment that brings them from being completely immersed in the ethnic culture (at the time of arrival in the host country) to being completely engaged in the mainstream culture (usually in time, across different generations) (for a review, Waters & Jimenez, 2005). This view implies a unidimensional view of acculturation (e.g., Gordon, 1964), which ranges within one pole representing full immersion in the culture of origin, and at the other pole a full immersion in the mainstream culture. However, this model has been criticized, because people exposed to two cultures can incorporate two co-existing cultural self-identities, acculturation processes not always end with a full immersion in the host cultural context, and the heritage culture not necessarily diminishes while the mainstream culture grows but rather they vary independently (e.g., Benet-Martínez, 2012; Ryder et al., 2000).

More recent studies hold that biculturalism (i.e., the combination of two cultures) is a more stable endpoint of the acculturation process (e.g., Berry, 1984). As shown in Figure 2, four types of acculturation strategies can be identified depending on the degree to which immigrants value to maintain (a) their ethnic culture, identity and characteristics, and (b) relationships with mainstream society (Berry, 1997). Integration amounts to

[1] Following previous literature, in this paper we will use the term “ethnic culture” as a synonym to “heritage culture”, “culture of origin”; and the term “mainstream culture” as synonym to “host culture”, “destination culture”, “culture of destination”, “receiving culture”, “dominant culture” or “majority culture” (Çelenk & Van de Vijver, 2014).

preference of both maintenance of ethnic culture and adoption of mainstream culture (biculturalism); assimilation refers to the desire to interact the mainstream culture while simultaneously losing the ethnic culture; separation refers to the desire to maintain the ethnic culture, not interacting with the mainstream culture; and marginalization is defined as little possibility or interest in ethnic cultural preservation accompanied with little possibility or interest in having relations with mainstream culture (Berry, 1997).

Fig. 2 – Acculturation strategies

		Interest in maintaining the ethnic culture	
		Yes	No
Interest in maintaining the mainstream culture	Yes	Integration	Assimilation
	No	Separation / segregation	Marginalization

Source: adapted from Berry (1997).

While the literature suggests that immigrants can choose their preferred acculturation strategy, and eventually change different strategies in time, this choice is also strongly influenced by the characteristics of the host society (e.g., integration strategies are more often adopted in multicultural societies; Berry & Kalin, 1995), shared desire to maintain the group's cultural heritage by other members of immigrant's ethnocultural group (e.g., separation is more "collective" than assimilation; Lalonde & Cameron, 1993), and personal attitudes and preferences towards these strategies (Berry et al., 1989). In addition, studies have shown that the preference for different strategies vary across public and private domains, for example maintaining ethnic culture may be stronger and present positive adaptive outcomes with regard to private domains (e.g., family, marriage), and maintaining host culture may be stronger and predict positive outcomes in public domains (e.g., school, work) (Arends-Tóth & Van de Vijver, 2003; Güngör, 2007).

To date, numerous measures of acculturation have been developed by cross-cultural psychologists, mainly focusing on the individual level of analysis through either demographic variables as proxies of acculturation (e.g., generational status, age at immigration, years lived in the new country) or psychometric scales (Ryder et al., 2000). Because of the limits of the unidimensional model of acculturation that we highlighted before, the measurement of the bi-dimensional model has been prevalent in recent literature (Çelenk & Van de Vijver, 2014) and suggested as the most

appropriate manner to study immigrants maintaining two independent cultural identities (i.e., the ethnic and the mainstream culture) (e.g., either bicultural individuals but also people who are not attached to either culture) (Kang, 2006).

2. Method

2.1 Research design

This study builds on unique primary interview data about immigrant firms located in two medium-sized towns (Parma and Bologna) in the region of Emilia-Romagna, Northern Italy. These two towns stand for a representative setting with regard to the immigration patterns within the region and are an interesting context characterized by high rates of business start-ups by immigrant entrepreneurs. As in other studies on immigrant entrepreneurship (e.g., Ndofor & Priem, 2011; Saxenian, 2002), we adopted two different sampling strategies, namely randomly identifying respondents from official business register[2], and snowballing.

A total of 130 immigrant entrepreneurs were face-to-faced interviewed, based on a structured questionnaire, from January to June 2012. We collected a wide range of information about the firms, such as the motivations and resources available at the foundation of the firm, the strengths and weaknesses of the firm, the corporate structure and the degree of ethnicity for products, suppliers and the clientele; and about the entrepreneurs, such as their personal backgrounds, migration history, acculturation orientation, and relationships with the Italian society, their ethnic group, with their country of origin.

2.2 Measurement and methodology

We measure acculturation through the Vancouver Index of Acculturation (VIA), which is a «self-report instrument that assesses

[2] To this regard, register data about enterprises owned by at least one foreign-born entrepreneur were provided by the Chamber of Commerce. We excluded those firms that were owned by entrepreneurs born from OECD countries. We applied a random sampling technique to obtain a provisional sample of respondents and, if after three attempts interviews could not be completed with the selected entrepreneur, we added additional randomly chosen candidates. Because most respondents considered the interviews to be an inconvenience or an intrusion, we enlarged our sample size through a snowball sampling technique.

several domains relevant to acculturation, including values, social relationships, and adherence to traditions» (Ryder et al., 2000, p 53). As reviewed by Çelenk and Van de Vijver (2014), the VIA is a suitable measure for acculturation as it is frequently used, displays good psychometric properties and covers multiple domains. The VIA is based on a bi-dimensional measure of acculturation and the two scales have been shown to be reliable, orthogonal, showing concurrent and factorial validity, independent, and pointing to distinctive and non-inverse patterns of correlation with external variables of interest, in both immigrant and second-generation samples (Ryder et al., 2000). The VIA is based on 20 paired questions (i.e., one question for ethnic language behavior and the other for mainstream language behavior), that we measure on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree)[3]. Example of two paired questions are the following: "I often participate in *my heritage* cultural tradition" and "I often participate in mainstream Italian cultural traditions" – where *my heritage* is to be replaced with the immigrants' country cultural tradition (e.g., Chinese). The heritage and mainstream subscores are calculated as a mean of the two respective sets of items. On average, our sample presents a heritage subscore equal to 5.03 (s.d. 1.31) and an Italian subscore equal to 5.54 (s.d. .93).

Following Arrighetti et al. (2014b), we adopt an index of ethnic hybridism (EH) able to take into account both the ethnic composition of the ownership structure (i.e., entrepreneurial team) and of the workforce. Specifically, this measure is constructed as follow:

EH	equal to 1 if the number of non-co-ethnic partners and employees is equal to zero
	equal to the following formula for all other firms: 1 + (non-co-ethnic partners/total nr.partners) + (nr. non-co-ethnic employees/ total nr. Employees)

[3] With respect to the original scale proposed by Ryders et al. (2000) we adopt a 7-point rather than a 9-point Likert scale in order to align measurement with other psychometric scales employed in our interviews, with the aim of reducing cognitive effort to interpret questions and provide answers. In addition, we replace "North American" with "Italian" mainstream culture. In order to retain meaning of the original scale items, we had the scale translated and back-translated by an academic fluent both in Italian and English language.

Based on the values displayed with regard to EH, we split the firms in our sample in three groups. First, "non-hybrid" (the value of their EH is equal to 1) (around 62% of the sample); second, "hybrids at an intermediate level" (their EH is greater than 1 and less than 1.5) (around 20% of the total); third, "hybrids at a high level" (their EH is greater than 1.5) (18% of the sample).

Our analyses compare the acculturation to the heritage or the mainstream culture across the three groups of entrepreneurs in non-hybrid, intermediate-hybrid, and high-hybrid firms, through oneway analysis of variance and Bonferroni post-hoc tests to identify significant differences.

2.3 Sample descriptives

The entrepreneurs in our sample were mainly males (67.7%), aged 40 (s.d. 9.95) and residing in Italy for around 17 years. Consistently with the distribution of immigrant entrepreneurs at the national level, the breakdown of the sample in terms of country of origin was dominated by a large group of immigrant entrepreneurs from Eastern Europe (e.g., Albania and Rumania) and from Africa (e.g., Morocco, Senegal). Around 64% of our respondents were highly educated (i.e., they had five-year college or university degrees). The majority of respondents were employed before opening the present company (93%). The majority of interviewed entrepreneurs are also founders of the company (78%).

At the time of interview, the firms were on average 7.2 years old (s.d. 7.06). Around 40% of firms are owned by more than one partner (on average, 1.76 partners). On average, firms employ 3.58 people (s.d. 4.97). The activities carried out by companies span retail trade (32.3%), other service activities (53.8%), construction (8.5%), and manufacturing (5.4%). Only 17.3% of companies sell ethnic products/services and the majority of companies cater to Italian customers (72.3%) and purchases from Italian suppliers (78.3%). Therefore, the firms in our sample are significantly oriented to operate in mainstream markets on local markets (e.g., 85% of clients and 65% of suppliers in the same city of the company). A summary description of key individual- and firm-level characteristics is provided in Table 1.

Tab. 1 – Characteristics of entrepreneurs and firms in the sample

	Percentage	*Freq.*
Gender of firm owner		
Male	67.7	88
Female	32.3	42
Geographical area of origin		
Eastern Europe (including Russia)	29.2	38
Middle East and Asia	26.2	35
Africa	35.4	46
Latin America	8.5	11
Educational attainment of firm owner		
No or primary school graduated	1.5	2
Graduate of vocational school	13.1	17
Graduate of two-year college/tech school	20.8	27
Graduate of five-year college/tech school	28.5	37
University degree graduated	36.2	47
Occupational condition before founding the firm		
Employed	93.0	120
Unemployed	6.3	9
No reply	0.7	1
Industry		
Manufacturing	5.4	7
Construction	8.5	11
Retail trade	32.3	42
Other service activities	53.8	70
Class size		
No employees	46.2	60
1 employee	17.7	23
2-5 employees	23.8	31
6-10 employees	6.2	8
More than 15 employees	6.2	8

3. Findings

As shown in Table 2, the oneway ANOVA highlighted significant differences across the three groups of firms with regard to the heritage component of the VIA ($p<0.001$), but not with regard to the mainstream component ($p=0.43$). In particular, a Bonferroni post-hoc test confirmed that entrepreneurs in firms with high levels of ethnic hybridism maintain a significantly weaker heritage cultural identity than entrepreneurs in non-hybrid (-1.16; $p<0.001$) and intermediate-hybrid companies (-1.36; $p<0.001$). To further test the robustness of our results, we employed a nonparametric test in order to consider the potential ordinal nature of the heritage and mainstream subscales (measured on an ordinal scale from 1 to 7). Implementing a Kruskall-Wallis H test we confirmed that there was a

statistically significant difference in the preservation of a heritage culture across the three groups ($\chi^2(2)=11.247$, $p<.005$), but no significant difference with regard to the acculturation to the mainstream culture ($\chi^2(2)=1.703$, $p=.427$).

Tab. 2 – Comparative values of heritage and mainstream dimensions across firms according to their level of ethnic hybridism

Company type (EH)	*Freq.*	*Heritage mean*	*Heritage s.d.*	*Italian mean*	*Italian s.d.*
Non-hybrid	80	5.21	1.24	5.51	.96
Hybrids at an intermediate level	26	5.40	.86	5.45	.87
Hybrids at a high level	24	4.04	1.53	5.76	.91

Because previous literature has suggested that demographic characteristics of the sample, and in particular the proportion of time spent in the host country, can influence and proxy acculturation – especially with regard to the mainstream culture (Ryder et al., 2000), we carried out some additional analyses to understand whether results would change distinguishing across recent or established migrants in Italy. As described above, our respondents lived in Italy on average for 17 years at the time of the interview (min 2; max 52; median 15.5). We therefore further replicated our analyses by splitting the sample in three groups of entrepreneurs: (1) migrants being in Italy for maximum 10 years (n=21); (2) migrants being in Italy for 10-20 years (n=73); and (3) migrants being in Italy for more than 20 years (n=36). Results regarding the heritage culture are reported in Table 3.

Tab. 3 – Comparative values of heritage dimension across firms according to their level of ethnic hybridism and entrepreneurs' time of residence in Italy

Company type (EH)	*In Italy for <10 years*		*In Italy for 10-20 years*		*In Italy for >20 years*	
	Heritage mean	*Heritage s.d.*	*Heritage mean*	*Heritage s.d.*	*Heritage mean*	*Heritage s.d.*
Non-hybrid	5.21	1.15	5.20	1.36	5.26	1.16
Hybrids at an intermediate level	5.37	1.02	5.55	.89	5.10	.86
Hybrids at a high level	4.05	2.41	3.69	1.74	4.09	1.07

Our analyses show that entrepreneurs in non-hybrid companies always maintain a stronger acculturation to their heritage culture than entrepreneurs in highly hybrid companies. However, results are statistically

significant only for entrepreneurs living in Italy for 10-20 years (p<0.005) and for more than 20 years (p<0.05). The small differences in the mean scores for entrepreneurs living in Italy for different periods of time shows that our results are not influenced by seniority of arrival in the host country. Results regarding the acculturation to the mainstream culture are reported in Table 4.

Tab. 4 – Comparative values of mainstream dimension across firms according to their level of ethnic hybridism and entrepreneurs' time of residence in Italy

Company type (EH)	*In Italy for <10 years*		*In Italy for 10-20 years*		*In Italy for >20 years*	
	Italian mean	*Italian s.d.*	*Italian mean*	*Italian s.d.*	*Italian mean*	*Italian s.d.*
Non-hybrid	5.39	1.02	5.59	.90	5.55	1.02
Hybrids at an intermediate level	5.58	1.38	5.39	.83	5.35	.91
Hybrids at a high level	6.05	.57	5.78	.97	5.63	.94

Confirming our main findings, none of the comparisons across non-hybrid, intermediate-hybrid and high-hybrid firms are statistically significant. In fact, the scores reported by entrepreneurs in highly-hybrid firms are slightly higher than the ones reported in the other categories of company, but differences are not statistically significant. These results seem to provide support to previous studies that showed that using a self-reported psychological measure of acculturation can provide useful information above and beyond demographic variables (Ryder et al., 2000).

Discussion and conclusions

Several authors have identified an "acculturation lag" (Light & Bonacich, 1988) as an important factor in the genesis and reproduction of ethnic business, both in the context of sojourning or of permanent settlement (Barret et al., 1999). According to this literature, immigrants with an identity strongly rooted in their culture of origin would maintain traditional values which would often lead them to evaluate and exploit business opportunities differently than indigenous business owners. Other authors have found identification with the ethnic community as a relevant determinant of immigrant entrepreneurship and the performance of these firms (e.g., Chaganti & Greene, 2002; Ndofor & Priem, 20119. Given the transformations in the forms and organizational characteristics of

immigrant entrepreneurship, in this paper we explore whether acculturation is also a variable that is modified by the evolving dynamics of ethnic hybridism.

Our findings are based on an analysis of a heterogeneous sample of 130 first-generation immigrant entrepreneurs and their companies in Italy. First, we find that all entrepreneurs in our sample display both a quite strong orientation towards the preservation of their heritage culture and towards the host (Italian) culture. This is an important finding that aligns with previous literature and shows that the two dimensions of acculturation are independent and can be equally held strong by immigrants. Second, we found that the identification with the heritage culture differ across entrepreneurs working in non-hybrid and hybrid firms. Specifically, entrepreneurs owners of firms with high levels of ethnic hybridism maintain a significantly weaker heritage cultural identity than entrepreneurs in non-hybrid and intermediate-hybrid companies. This result was confirmed across sub-samples of entrepreneurs more or less recently arrived in Italy. Therefore, it would seem that immigrant entrepreneurs working in highly ethnically-hybrid contexts are more likely to lose (a relatively modest) part of their ethnic identification, while retaining a strong mainstream identification. This seems to suggest that this category of entrepreneurs follows a more assimilationist acculturation strategy than the other categories. Third, we did not find any significant difference, across the three levels of firms' ethnic hybridity, with regard to the entrepreneurs' identification with the mainstream culture. Because previous literature has found that it is rather the mainstream component of acculturation that has positive impacts on the socio-economic adaptation of migrants (e.g, Ryder et al., 2000), our findings do not seem to find strong evidence with regard to the greater maintenance of mainstream culture on behalf of entrepreneurs in ethnically hybrid firms. We therefore see this as a fruitful avenue for future research that could shed further light on entrepreneurs' identification with the mainstream culture and its impact on business-level outcomes. In our sample, it might be observed that results could be influenced by the relatively extensive mean length of residence in Italy of entrepreneurs. Therefore, future studies could be built in order to consider wide variations in terms of exposure to the mainstream culture (e.g., including participants raised in the heritage culture vs. in the mainstream culture; first-generation and second-generation immigrants).

Our study presents several limitations that are worth considering to interpret results and to suggest future research opportunities on this topic. First, the study was implemented in two representative cities in a region in Northern Italy, but our knowledge on this topic would benefit from further

replications in other contexts and with wider samples. Second, although acculturation is processual in nature, in this paper we take a cross-sectional stance and therefore are not able to follow the patterns of evolution of acculturation orientations in time. Connected to this point, because our sample is only composed by first-generation immigrants, it would be important for future studies to explore any difference emerging due to generational differences. Third, this study only intended to focus on the linkages between entrepreneurs' acculturation and the degree of ethnic hybridism of his/her company. We acknowledge that other outcomes might be additionally considered by future studies both at the individual level (e.g., family life satisfaction) and at the organizational level (e.g., resources acquired from ethnic or Italian ties). Finally, while the two-dimensional model of acculturation is widely established and used by cross-cultural psychology scholars, the multidimensional or pluralistic model of acculturation has emerged to further model this complex and multifaceted phenomenon (Porter & Washington, 1993). We therefore invite scholars to further investigate this topic, so to increase the diversity of theories and methodological approaches adopted to understand an increasingly relevant issue in contemporary and future society.

References

Altinay, L. (2008). The Relationship Between an Entrepreneur's Culture and the Entrepreneurial Behaviour of the Firm. *Journal of Small Business and Enterprise Development*, 15(1): 111-29.

Altinay, L. & Altinay E. (2006). Determinants of Ethnic Minority Entrepreneurial Growth in the Catering Sector. *The Service Industries Journal*, 26(2): 203-221.

Ambrosini M. (2005). *Sociologia delle migrazioni*. Il Mulino, Bologna.

Amin V. (1995). Informal and External Networks. *Paper presented to the Conference on Researching Asian Entrepreneurship, London, Roehampton Institute, November 9*.

Arends-Tóth, J. & Van de Vijver F. J. R. (2006). Assessment of psychological acculturation: Choices in designing an instrument. In: Sam D.L. & Berry J.W., Eds., *Cambridge Handbook of Acculturation Psychology*, Cambridge University Press, Cambridge.

Arrighetti, A., Bolzani, D., & Lasagni A. (2014a). Beyond the enclave? Break-outs into mainstream markets and multicultural hybridism in ethnic firms. *Entrepreneurship & Regional Development*, *26*(9-10): 753-777.

Arrighetti, A., Bolzani, D., & Lasagni, A. (2014b). Motivazioni imprenditoriali e percorsi evolutivi dell'impresa etnica. In: Pilotti L., De Noni I. & Ganzaroli A., Eds., *Il Cammino infinito. Imprenditorialità multiculturale tra varietà, innovazione territori,* Franco Angeli, Milan: 126-150

Arrighetti, A., Foresti, G., Fumagalli, S. & Lasagni, A. (2017). Imprenditoria straniera in Italia: differenze nei modelli organizzativi e nelle performance. Milan, Collana ricerche Intesa Sanpaolo.

Aycan, Z. & Berry, J.W. (1996). Impact of employment-related experiences on immigrants'well-being and adaptation to Canada. *Canadian Journal* of *Behavioural Science*, 28: 240-251.

Barberis, E. (2008). *Imprenditori immigrati: tra inserimento sociale e partecipazione allo sviluppo*, Ediesse, Roma.

Barberis, E. & Violante A. (2017). Chinese Immigration to Italy and Economic Relations with the Homeland: A Multiscalar Perspective. In: Guercini S., Dei Ottati G., Baldassar L., & Johanson G., Eds., *Native and Immigrant Entrepreneurship: Lessons for Local Liabilities in Globalization from the Prato Case Study*, Springer: 31-52.

Barrett, G., Jones, T., & McEvoy, D. (1996). Ethnic Minority Business: Theoretical Discourse in Britain and North America. *Urban Studies*, 33(4-5): 783-809.

Baycan-Levent, T., Masurel, E., & Nijkamp, P. (2004). Trends in Break-out Strategies of Ethnic Entrepreneurs. In: Vaz T., Morgan E. & Nijkamp P., Eds, *The New European Rurality: Strategies for Small Firms*, Ashgate, Aldershot: 143–156.

Beiser, M., Barwick, C, Berry, J.W., da Costa G., Fantino A., Ganesan S., Lee C., Milne W., Naidoo J., Prince R., Tousignant M., & Vela E. (1988). *Mental health issues affecting immigrants and refugees.* Health and Welfare Canada, Ottawa.

Benet-Martínez, V. (2012). Multiculturalism: Cultural, personality, and social processes. In: Deaux K. & Snyder M., Eds., *Handbook of personality and social psychology.* Oxford University Press, Oxford.

Berry, J.W. (1984). Multicultural policy in Canada: A social psychological analysis. *Canadian Journal of Behavioral Science*, 16: 353-370.

Berry, J.W. (1990). Psychology of acculturation. In Berman J, Ed., *Cross-cultural perspectives: Nebraska Syniposium on Motivation*. University of Nebraska Press, Lincoln: OI-234.

Berry, J.W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology: An International Review*, 46(1): 5-68.

Berry, J.W. (2001). A psychology of immigration. *Journal of Social Issues*, 57(3): 615-631.

Berry, J.W., Kim, U., Minde, T., & Mok, D. (1987). Comparative studies of acculturative stress. *International Migration Review*, 21: 491-451.

Berry, J.W. & Kalinm, R. (1995). Multicultural and ethnic attitudes in Canada. *Canadian Journal* of *Behavioural Science*, 27: 301-320.

Berry, J.W., Kim, U., Power, S., Young, M. & Bujaki, M. (1989). Acculturation attitudes in plural societies. *Applied Psychology: An lnternational Review*, 38: 185-206.

Bolzani, D. (2013). *Internationalization intentions: Micro-foundations and psychological distance perceptions in immigrant and non-immigrant entrepreneurs*. Unpublished doctoral dissertation, University of Bologna.

Bonacich, E. (1973). A theory of middleman minorities. *American Sociological Review*: 583-594.

Bonacich, E., & Model, J. (1980). *The economic basis of ethnic solidarity: Small business in the Japanese American community*. University of California Press, Berkley.

Bourhis, R.Y, Moise, L.C., Perrault, S. & Senecal, S. (1997). Towards an interactive acculturation model: A social-psychological approach. *International Journal of Psychology*, 32: 369-386.

Brenner, G.A., Menzies, T.V., Dionne, L., & Filion, L.J. (2010). How Location and Ethnicity Affect Ethnic Entrepreneurs in Three Canadian Cities. *Thunderbird International Business Review*, 52(2): 153–171.

Brzozowski, J., Cucculelli, M., & Surdej, A. (2014). Transnational ties and performance of immigrant entrepreneurs: the role of home-country conditions. *Entrepreneurship & Regional Development*, *26*(7-8): 546-573.

Butler, J.S., & Greene, P. G. (1997). Ethnic Entrepreneurship: The Continuous Rebirth of American Enterprise. In: Sexton D.L. & Smilor R.W., Eds., *Entrepreneurship 2000*. Upstart Publishing Co., Chicago: 267-289.

Çelenk, O. & Van de Vijver, F.J. (2014). Assessment of psychological acculturation and multiculturalism: An overview of measures in the public domain. *The Oxford handbook of multicultural identity*: 205-226.

Chaganti, R., & Greene, P.G. (2002). Who are migrant entrepreneurs? A study of entrepreneurs migrant involvement and business characteristics. *Journal of Small Business Management*, 40: 126–143.

Deakins, D. (1999). *Entrepreneurship and small firms.* Graw Hill, London.

Engelen, E. (2001). 'Breaking in' and 'Breaking out': A Weberian Approach to Entrepreneurial Opportunities. *Journal of Ethnic and Migration Studies*, 27(2): 203-223.

Gordon, M.M. (1964). *Assimilation in American Life.* Oxford University Press, New York.

Graves, T. (1967). Psychological acculturation in a tri-ethnic community. *South-Western Journnl of Anthropology*, 23: 337-350.

Guercini, S., Dei Ottati, G., Baldassar, L., & Johanson, G. (2017a). *Native and Immigrant Entrepreneurship: Lessons for Local Liabilities in Globalization from the Prato Case Study*. Springer.

Guercini, S., Milanesi, M., & Dei Ottati, G. (2017b). Paths of evolution for the Chinese migrant entrepreneurship: a multiple case analysis in Italy. *Journal of International Entrepreneurship*, 15: 266-294.

Güngör, D. (2007). The interplay between values, acculturation, and adaptation: A study of Turkish Belgian adolescents. *International Journal of Psychology*, 42: 380-392.

Hettlage, R. (2008). From Ethnic Business to Hybrid Entrepreneurs: 35 Years of Research on Self-Employed Immigrants. *Kalaidos Fachhochschule Schweiz Working Paper* 03.

Kang, S.M. (2006). Measurement of acculturation, scale formats, and language competence: Their implications for adjustment. *Journal of Cross-Cultural Psychology*, 37(6): 669-693.

Kloosterman, R.C., & Rath, J. (2001). Immigrant Entrepreneurs in Advanced Economies: Mixed Embeddedness Further Explored. *Journal of Ethnic and Migration Studies*, 27(2): 189–202.

Kloosterman, R.C., & Rath, J. (2010). Shifting Landscapes of Immigrant Entrepreneurship. In OECD, *Open for Business: Migrant Entrepreneurship in OECD Countries*. OECD Publishing, Paris.

Lalonde, R., & Cameron, J. (1993). An intergroup perspective on immigrant acculturation with a focus on collective strategies. *International Journal of Psychology*, 28: 57-74.

Leung, M. W. H. (2001). Get It Going: New Ethnic Chinese Business. The Case of Taiwanese-owned Computer Firms in Hamburg. *Journal of Ethnic and Migration Studies*, 27 (2): 277–294.

Light, I. H. (1972). *Ethnic enterprise in America: Business and welfare among Chinese, Japanese, and Blacks*. Univ of California Press.

Light, I. (1984). Immigrant and ethnic enterprise in North America. *Ethnic and racial studies*, *7*(2): 195-216.

Light, I., & Bonacich, E. (1988). *Immigrant Entrepreneurs: Koreans in Los Angeles, 1965-1982*. Univ of California Press.

Masurel, E., Nijkamp, P., Tastan, M., & Vindigni, G. (2002). Motivations and Performance Conditions for Ethnic Entrepreneurship. *Growth and Change*, 33(2): 238-260.

Matsumoto, D., LeRoux, J.A., Robles, Y. & Campos, G. (2007). The Intercultural Adjustment Potential Scale (ICAPS) predicts adjustment above and beyond personality and general intelligence. *International Journal of Intercultural Relations*, 31: 747-759

Menzies, T.V., Filion, L.J., Brenner, G.A., & Elgie S. (2007). Measuring Ethnic Community Involvement: Development and Initial Testing of an Index. *Journal of Small Business Management*, 45(2): 267–282.

Milanesi, M., Guercini, S. and Waluszewski, A. (2016). A Black Swan in the district? An IMP perspective on immigrant entrepreneurship and changes in industrial districts, *IMP Journal*, 10(2): 243-259,

Mushaben, J.M. (2006). Thinking Globally, Integrating Locally: Gender, Entrepreneurship and Urban Citizenship in Germany. *Citizenship Studies*, 10(2): 203-227.

Ndofor, A.H., & Priem, R.L. (2011). Immigrant entrepreneurs, the ethnic enclave strategy, and venture performance. *Journal of Management*, 37(3): 790-818.

Pecoud, A. (2004). Entrepreneurship and Identity: Cosmopolitanism and Cultural Competencies among German-Turkish Business People in Berlin. *Journal of Ethnic and Migration Studies*, 30(1): 3–20.

Porter, JR., & Washington, R.E. (1993). Minority identity and self-esteem. *Annual Review of Sociology*, *19*(1): 139-161.

Portes A., Guarnizo L.E. & Haller W.J. (2002). Transnational entrepreneurs: An alternative form of immigrant economic adaptation. *American Sociological Review*, 67(2): 278-298.

Portes A., & Sensenbrenner J. (1993). Embeddedness and Immigration: Notes on the Social Determinants of Economic Action. *American Journal of Sociology*, 98: 1320–1350.

Portes A., & Shafer S. (2007). Revisiting the enclave hypothesis: Miami twenty-five years later. In *The sociology of entrepreneurship* (pp. 157-190). Emerald Group Publishing Limited.

Portes A., & Zhou M. (1992). Gaining the Upper Hand: Economic Mobility Among Immigrant and Domestic Minorities. *Ethnic and Racial* Studies, 15: 491-522.

Ram M. (2003). Paving Professional Futures. *International Small Business Journal*, 21(1): 55-69.

Ram M., & Hillin G. (1994). Achieving "Break-out": Developing Mainstream Ethnic Minority Business. *Small Business Enterprise and Development*, 1(1): 15–21.

Ram M., & Jones T. (2008). Ethnic-minority businesses in the UK: a review of research and policy developments. *Environment and Planning C: Government and Policy*, *26*(2): 352-374.

Ram M., Jones T. & Villares-Varela M. (2017). Migrant entrepreneurship: Reflections on research and practice. *International Small Business Journal*, 35(1): 3-18.

Rath J. (2000). Immigrant Businesses and Their Economic, Politico-Institutional and Social Environment. In: Rath J., Ed., *The Economic, Political and Social Environment*, Macmillan Press, Basingstoke.

Redfield R., Linton R., & Herskovits M. (1936). Memorandum on the study of acculturation. *American Anthropologist*, 38: 149-152.

Richmond A. (1993). Reactive migration: Sociological perspectives on refugee movements. *Journal* of *Refugee Studies*, 6(1): 7-24.

Ryder A.G., Alden L.E. & Paulhus D.L. (2000). Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment. *Journal of Personality and Social Psychology*, 79: 49-65.

Rusinovic K. (2008). Moving between markets? Immigrant entrepreneurs in different markets. *International Journal of Entrepreneurial Behavior & Research*, 14(6): 440-454.

Sahin M., Nijkamp P. & Suzuki S. (2014). Contrasts and similarities in economic performance of migrant entrepreneurs. *IZA Journal of Migration*, 3(1): 7.

Sassen S. (2001). *The Global City: New York, London, Tokyo*. Princeton University Press, Princeton.

Saxenian A. (2002). Silicon Valley's new immigrant high-growth entrepreneurs. *Economic Development Quarterly*, 16(1): 20-31.

Searle W. & Ward C. (1990). The prediction of psychological and sociocultural adjustment during cross-cultural transitions. *lnternational Journal* of *Inrercultural Relations*, 14: 449-464.

Selmer J., & De Leon C. (1996). Parent cultural control through organizational acculturation: HCN employees learning new work values in foreign business subsidiaries. *Journal of Organizational Behavior*: 557-572.

Shin E., & Han S. (1990). Korean immigrant small businesses in Chicago: an analysis of the resource mobilization process. *Amerasia Journal*, 16(1): 39-60.

Van der Zee K. I. & Van Oudenhoven J. P. (2000). The Multicultural Personality Questionnaire: A multidimensional instrument of multicultural effectiveness. *European Journal of Personality*, 14: 291-309

Waldinger R. (2000). The Economic Theory of Ethnic Conflict: A Critique and Reformation. In: Rath J. (ed.) *Immigrant Businesses. Migration, Minorities and Citizenship*. Palgrave Macmillan, London.

Waldinger R., Aldrich H., & Ward R. (1990). *Ethnic Entrepreneurs: Immigrant Business in Industrial Societies*. Sage Publications, Thousand Oaks.

Walton-Roberts M., & Hiebert D. (1997). Immigration, Entrepreneurship and the Family: Indo-Canadian Enterprise in the Construction Industry of Greater Vancouver, *Canadian Journal of Regional Science*, 20(1–2): 119–140.

Wang C. L., & Altinay L. (2012). Social Embeddedness, Entrepreneurial Orientation and Firm Growth in Ethnic Minority Small Businesses in the UK, *International Small Business Journal*, 30(3): 3-23.

Ward R. (1987). Ethnic Entrepreneurs in Britain and Europe. In Goffee R. & Scase R., Eds., *Entrepreneurship in Europe*. Croom Helm, London.

Ward C. & Searle W. (1991). The impact of value discrepancies and cultural identity on psychological and sociocultural adjustment of sojourners. *lnternational Journal* of *Intercultural Relations*, 15: 209-225.

Waters M.C., & Jiménez T.R. (2005). Assessing immigrant assimilation: New empirical and theoretical challenges. *Annual Review of Sociology*, 31: 105-125.

Diversity and entrepreneurship in the city of Athens: Different views and ambiguous perceptions of local entrepreneurs[◊]

di Dimitris Balampanidis[*]

Abstract

The aim of this paper is to explore the role that the increasing urban diversity plays in the establishment, development and competitiveness of entrepreneurship. The study focuses on a central neighbourhood of Athens (Akadimia Platonos) and takes into account the condition of a long and continuous economic crisis. Research questions are explored through in-depth interviews with local entrepreneurs. The main argument of the paper is that perceptions of urban diversity differ depending on the individual profile of the interviewees and the aspects of diversity being discussed. It is suggested that the issue of urban diversity should be opened up to public debate, the aim being to understand and adequately address all its multiple aspects and effects on entrepreneurship and everyday life in general.
Keywords: diversity, entrepreneurship, perceptions, ambiguities, Athens.
JEL Classification: J15, L26.

Diversità e imprenditorialità ad Atene: Differenti visioni e percezioni ambigue degli imprenditori locali

Riassunto

L'obiettivo di questo lavoro è di esplorare il ruolo che la crescente diversità urbana svolge nell'instaurazione, nello sviluppo e nella competitività dell'imprenditorialità. Lo studio si concentra su un quartiere centrale di Atene (Akadimia Platonos) e prende in considerazione la condizione dettata da una lunga e ininterrotta crisi economica. Le domande di ricerca vengono indagate attraverso interviste approfondite con imprenditori locali. L'ipotesi principale è che le percezioni della diversità urbana varino a seconda del profilo individuale dei soggetti intervistati e degli aspetti della diversità messi in discussione. Viene suggerito che il tema della diversità urbana venga aperto al dibattito pubblico, con l'obiettivo di comprendere e affrontare in modo adeguato tutti i suoi molteplici aspetti ed effetti sull'imprenditorialità e sulla vita quotidiana in generale.
Parole chiave: diversità, imprenditorialità, percezioni, ambiguità, Atene
Classificazione *JEL*: J15, L26.

[◊] This paper is based on research conducted by the author for the research project "DIVERCITIES - Governing Urban Diversity. Creating social cohesion, social mobility and economic performance in today's hyper-diversified cities". This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 319970. The views expressed in this paper are the sole responsibility of the author and do not necessarily reflect the views of European Commission.
[*] National Centre for Social Research, Athens, Greece 9 Kratinou & Athinas st., 105 52 Tel.: 00302107491600, Fax: 00302107489800. E-mail:d.balabanidis@yahoo.com

Introduction

Similarly to many other metropolitan cities around the globe, Athens has long been - and still is - a diverse city, both in terms of its built environment and of its population. Especially since the early 1990s, when the so-called new immigration to Greece began, the population of major Greek urban areas, and primarily Athens, has been significantly diversified. Large inflows of immigrants and refugees - originating mostly from the Balkans and Eastern Europe (Cavounidis, 2002) but also from the Middle East, Asia and Africa (Kandylis et al., 2012) - contributed not only to the ethnic diversity of cities but also to diversity in cultures and lifestyles.

Against the background of a continuously increasing urban diversity, the city of Athens is expected to ensure social cohesion and attain high rates of economic growth, that is, to guarantee and increase the well-being of the population. This is a significantly difficult challenge, given the context of a long and continuous crisis which broke out as a fiscal problem of a massive budget deficit back in 2007, but evolved into a multi-faceted humanitarian crisis. So far, the crisis has deeply affected a wide range of social categories - primarily women, young people and immigrants (Vaiou, 2014) - in all fields of everyday life, such as housing, entrepreneurship, education, health, transport and the environment (Serraos et al., 2016). Especially in the field of entrepreneurship, which is at issue here, the most serious and visible effects of the crisis include the dramatic decrease of turnover and profits in trade, as well as the increasing number of closed businesses, even in highly commercial and touristic areas of the city.

Successful entrepreneurship is considered a key factor for cities to stimulate economic growth, assure social cohesion and thus improve the well-being of citizens. This is the reason why entrepreneurial competitiveness has been widely set as an important objective of urban policies (Fainstein, 2005; Bodaar and Rath, 2005). In this spirit, successful entrepreneurship could contribute to the achievement of economic success in the case of Athens too, thus providing a way out of the long-lasting crisis. Considering various key factors and favourable conditions for entrepreneurial success, this paper examines if and to what extent the development of entrepreneurship in the city of Athens could profit from urban diversity in particular. Diversity is examined in all its aspects, including diversity in land uses and urban functions, social and ethnic diversity, but also diversity in cultures and lifestyles. The paper questions whether these aspects of urban diversity constitute a key factor for the engagement of people in entrepreneurial activities, for their locational choices, as well as for the economic performance of their businesses.

1. The role of urban diversity in entrepreneurship: evidence emerging from the literature

In global literature relating to entrepreneurship, scholars have revealed various motivating factors and conditions that favour the establishment, development and competitiveness of entrepreneurial activities in cities. Such favourable factors and conditions may relate to the socio-demographic characteristics of entrepreneurs (such as gender, age, family background and educational level), to individual preferences and perceptions (such as preference for self-employment and perception of job security, risk tolerance, professional advancement and economic performance), as well as to contextual variables (such as the local economic environment, institutional framework, administrative complexities, availability of financial support, technological progress and cultural particularities) (Armington and Acs, 2002; Blanchflower, 2004; Freytag and Thurik, 2007; Grilo and Thurik, 2008). Moreover, the establishment, development and competitiveness of entrepreneurship in certain city neighbourhoods have been linked to the existing human capital. Scholars have put particular emphasis on the importance of established local social networks, that is, family bonds, circles of friends or relationships between colleagues (Granovetter, 1985; Aldrich and Zimmer, 1986; Greve, 1995; Jensen, 2001; Hoang and Antoncic, 2003; Ripolles and Blesa, 2005). Social networks provide entrepreneurs with a wide range of valuable resources (such as access to information, advice, knowledge, skills and finance, social legitimacy, reputation and credibility), all of which have a positive impact on the economic performance of businesses (Portes and Sensenbrenner, 1993; Völker and Flap, 2004; Pichler and Wallace, 2007; Klyver et al. 2008; Schutjens and Völker 2010).

The research has paid particular attention to "ethnic entrepreneurship", with scholars revealing a wide range of factors that motivate immigrants to engage in entrepreneurial activities and help their businesses achieve good economic performance (Kloosterman et al. 1999; Kloosterman and Rath, 2001). For instance, it is quite common for engagement in entrepreneurship to be an alternative for immigrants who face long-term unemployment or economic and social discrimination in the local market (Bonanich, 1973). Choosing a specific entrepreneurial sector may depend on the family environment, educational level, professional experience, ethnic and migration background, stage in the family life cycle, even on individual characteristics and preferences (Baycan-Levent et al., 2003; Basu, 2004). As for locational choices, they may relate to the existence of a gap in the local market or of certain attractive spatial patterns, such as the so-called entrepreneurial ethnic niches or enclaves (Waldinger, 2003). Here too, ethnic-based social

networks play an important role in locational choices: relatives and friends from the country of origin often provide migrant entrepreneurs with start-up capital, low-waged labour, an initial customer base and supplier chain, information, knowledge and solidarity (Portes, 1995).

All motivating factors and favourable conditions mentioned above (i.e. the individual characteristics of entrepreneurs, social networks and contextual variables) have been described as the "entrepreneurship capital" of cities (Audretsch and Keilbach, 2004), namely as valuable resources for the establishment, development and competitiveness of entrepreneurial activities. But what about the role of urban diversity in particular? Is urban diversity - in all its aspects - part of the "entrepreneurship capital" of cities?

Studying the role that urban diversity plays in the establishment, development and competitiveness of entrepreneurship in urban space, scholars have actually highlighted significant positive effects. Generally speaking, it is observed that cities that are open to diversity develop a more lively and dynamic entrepreneurial life than cities that are relatively closed (Fainstein, 2005; Taşan-Kok and Vranken, 2008; Eraydin et al., 2010). A diverse urban population may stimulate the development of new goods and services (Leadbeater, 2008), while a diverse workforce may create more knowledge, generate new ideas and make better decisions (Page, 2007). Especially "ethnic entrepreneurs" - through their immigration experience - may contribute to knowledge spillovers and the international networking of local markets, thus reducing information and communication costs for businesses (Saxenian and Sabel, 2008). Overall, ethnic diversity in cities has proved to be not only economically profitable, but also beneficial for creativity, productivity and innovation, at least in the long term (Alesina and La Ferrara, 2005; Ottaviano and Peri, 2006). Moreover, cultural diversity has proved to be attractive for creative, highly skilled and liberal-minded entrepreneurs, considered key drivers of urban economic growth (Florida, 2002; Boschma and Fritsch, 2009).

However, the positive impact of urban diversity on the establishment, development and competitiveness of entrepreneurship constitutes only one side of the coin. Diversity may also have a negative impact on entrepreneurship since, for example, it may reduce trust and cooperation between different population groups, give rise to conflicts of interests and thus make knowledge-sharing, decision-making, creativity and productivity difficult (Alesina and La Ferrara, 2005; Page, 2007; Kemeny, 2012; Churchill, 2017). Moreover, the positive impact of urban diversity is not confirmed in all different contexts. In fact, the effects of urban diversity on the development of entrepreneurship, employment rates and wages may vary significantly from one city to another. For instance, research evidence for US cit-

ies suggests that cultural diversity may be linked to increasing productivity and price gains (Saiz, 2003; Ottaviano and Peri, 2006; Sparber, 2010) but also to social, political and economic costs, at least in the short term (Putnam, 2007). Similarly, findings from UK cities show some positive links between diversity and urban economic performance, but also zero or even negative associations between some diversity measures and urban wages or employment rates (Nathan, 2011; 2015). Given its ambiguous effects, it is not surprising that diversity - in terms of gender, culture and ethnicity - is only partially "a core motive for entrepreneurship", as observed by Alexandre-Leclair (2014) for both North American and West European cities.

According to evidence stemming from the literature, urban diversity emerges as a key factor (positive, negative or both) for the establishment, development and competitiveness of entrepreneurship in urban space. However, scholars underline that there has been little research assessing the impact of diversity and it has focused mostly on certain cities of the world (Nathan, 2011; Alexandre-Leclair, 2014). This leads to a limited understanding of the complexity of diversity, especially when it comes to official urban policies, but also to unofficial initiatives aiming at the development of socially just and economically inclusive cities (Syrett and Sepulveda, 2011; 2012). For these reasons, scholars call for further research and theoretical elaboration on the question of diversity and entrepreneurship in various countries around the globe, as well as at all different scales of space (i.e. at the country, city and neighbourhood level).

The relationship between urban diversity and entrepreneurship also needs to be further explored in the case of Athens. So far, there is only a limited literature (Lianos and Psiridou, 2008), focused mainly on "ethnic entrepreneurship" developed in central neighbourhoods of the city against the background of the deep and continuing economic crisis. Scholars have focused on the particular forms and geography of "ethnic businesses", as well as on the perceptions of "ethnic entrepreneurship" by the locals, revealing interethnic entrepreneurial relationships, conflicts and competition (Kandylis et al., 2007; Mavrommatis, 2008; Tsiganou, 2013). Moreover, scholars have focused on high concentrations of migrant businesses and their economic performance, stressing the vital contribution of "migrant entrepreneurship" to the regeneration of local markets and the attractiveness of the city (Mavrommatis, 2008; Balampanidis and Polyzos, 2016; Hatziprokopiou and Frangopoulos, 2016). However, research attention has not yet turned to the study of urban diversity in particular as a key factor for the establishment, development and competitiveness of entrepreneurship.

2. Research questions and methodological considerations

As already mentioned, although the relationship between urban diversity and entrepreneurship has drawn the attention of the academic world, empirical research is quite limited and usually provides evidence at the macro level. The research presented in this paper provides more insight into the potential role of urban diversity in the establishment, development and competitiveness of entrepreneurship, focusing on the city of Athens and adding evidence at the micro level of a specific neighbourhood close to the city center.

Following the existing scientific debate and considering issues emerging from the literature, the main question here concerns the effects of urban diversity on entrepreneurial activities established and developed in an urban environment. Diversity is explored in all its aspects, including diversity in land uses and urban functions, social and ethnic diversity, as well as diversity in cultures and lifestyles. Is urban diversity a motivating factor for people to engage in entrepreneurial activities? Is it an important parameter for the locational choices of entrepreneurs? And, finally, is it a success or a failure factor for the economic performance of businesses?

The research questions raised above are of particular importance, especially in the case of Greece and its capital city, given the local condition of a long and continuous crisis that has deeply affected entrepreneurship and especially small and medium-sized businesses. The Hellenic Statistical Authority estimates that turnover in retail trade at the national level has dropped by almost 40% since 2008 (ELSTAT, 2017). At the same time, closed businesses in the centre of Athens reached 32% in 2013, compared to 16% in 2010 (INEMY-ESEE, 2015, p. 4); these figures vary depending on the street, neighbourhood and type of business (Balampanidis et al., 2013).

The research questions raised above are also of particular interest in the specific study area, i.e., the neighbourhood of Akadimia Platonos. This is a historic and dynamic neighbourhood of Athens located at the south-western part of the city, in close proximity to the city centre, and displays some crucial characteristics for the research presented here. Firstly, Akadimia Platonos is a diverse neighbourhood, both in terms of land uses as well as population. In fact, it is a multi-functional area (home to residential, commercial, manufacturing, leisure, touristic and other activities) with inhabitants of various social and ethnic backgrounds. Secondly, it is one of the city's neighbourhoods that have been hit the hardest by the crisis, with closed businesses reaching almost 50% along its very central commercial streets.

To give some more contextual information, Akadimia Platonos has almost 65,000 inhabitants (EKKE-ESYE, 2005) and, similarly to most of the central areas of Athens, it used to be, and still is, a socially and ethnically mixed neighbourhood. However, two major demographic changes occurred during the last few decades. The first one took place in the 1980s, when Akadimia Platonos lost a considerable number of its residents after they moved to the suburbs in search of better living conditions, following a general trend of suburbanisation. This move to the suburbs was "socially asymmetric", involving only a part of the middle and upper socio-professional categories (Emmanouel, 2006). Thus, despite the fact that suburbanisation trends continued during the 1990s and 2000s, the neighbourhood still preserves a socially diverse population. The second important demographic change took place during the early 1990s, when the so-called new immigration to Greece, and primarily to Athens, began. Akadimia Platonos turned into one of the most multi-ethnic neighbourhoods of the city, with immigrants representing 20% of the local population. Immigrants from Albania constitute by far the largest migrant group in the neighbourhood (representing 9% of the local population), followed by Pakistani immigrants, who represent only 0.83 % (EKKE-ESYE, 2005). The remaining 80% of the local population consists of Greek nationals (EKKE-ESYE, 2005), some of them born and raised in the neighbourhood, others having in-migrated during the rapid urbanisation period of the 1960s and the 1970s and others having moved in recently, i.e., during the last decade. Especially during the last five years, it seems that the neighbourhood attracts newcomers of young age, high educational background and cultural capital, such as freelancers, engineers and artists, who cannot afford to live and work in other more expensive central neighbourhoods of the city.

Against the contextual background presented above, the relationship between urban diversity and entrepreneurship in the neighbourhood of Akadimia Platonos was explored through qualitative research, which included 40 in-depth interviews with local entrepreneurs.[1] Interviews were conducted during the last trimester of 2015 and given by a diverse sample of interviewees. In fact, both Greek and migrant entrepreneurs were interviewed, the latter originating from Albania and Pakistan. The sample comprised almost the same number of women and men (17 and 23 interviewees respectively), aged between 25 and 70, of various socio-economic backgrounds (from lower class to upper-middle class individuals) and different educational levels (from basic secondary and technical education to higher

[1] For the research report, written as part of the EU-FP7 DIVERCITIES research project, see Balampanidis et al., 2016.

education). The large majority of the interviewed entrepreneurs are active in common commercial activities and everyday services, such as food and clothing stores, coffee shops and restaurants, tailoring and shoe-making businesses, pharmacies, hair salons and garages. An important number of the interviewed entrepreneurs provide more specialised services in the sector of education, sports and health, through local businesses like private tutoring schools for secondary education, language and computing classes, fitness centres and private clinics. Finally, a smaller number of the interviewed entrepreneurs are engaged in creative and innovative businesses related to cultural activities, arts, engineering, new and high-technology products and services. Overall, the sample of interviewees sufficiently reflects the various types of entrepreneurship developed in the neighbourhood.

It is important to highlight that urban diversity and its role in entrepreneurship were not explored as an objective reality, but rather through the subjective perception of each interviewee as expressed through the interviews. As Vertovec suggests (2012, p. 306), diversity "has eventually been elaborated, promoted and variously codified to the point that it is now part of everyday understanding"; it represents a "set of ideas and practices that has been added to the social imaginary, the moral order", as the latter have been described by Charles Taylor (2004). In this sense, discussing diversity with local entrepreneurs in Akadimia Platonos revealed their individual views on, and perceptions of, diversity and its effects, which eventually shape the "reality" of their everyday life in the study area. As will be shown below, the initial assumption that there is no common perception of urban diversity but, instead, perceptions differ depending on the individual profile of the interviewees and the aspects of diversity being discussed, was finally confirmed.

3. Discussing urban diversity with entrepreneurs in Akadimia Platonos

Interviews with local entrepreneurs revolved around the three main research questions which are being explored here: if and to what extent urban diversity - in all its aspects - constitutes, first, a motivating factor for people to engage in entrepreneurial activities; second, an important parameter for the locational choices of entrepreneurs; and, third, a success or failure factor for the economic performance of businesses. In the following, the opinions expressed by the interviewed entrepreneurs are given through their

own statements, and are thoroughly commented on according to the author's subjective interpretation.

3.1 Diversity as motivation for establishing a business in a specific neighbourhood

The motivating factors for entrepreneurial engagement in the neighbourhood of Akadimia Platonos highlighted by the interviewed entrepreneurs are in line with those already revealed in the literature. In general, they are related to the entrepreneurs' social and ethnic background, to their individual preferences and perceptions, as well as to city- and neighbourhood-specific variables. Among all motivating factors, social networks established in the neighbourhood are proved to be of particular importance for the majority of the interviewed entrepreneurs. As for urban diversity, which is at issue here, it is only partially a motivating factor for entrepreneurs to set up their business in the specific neighbourhood.

General motivations for establishing a business strongly relate to the educational and professional background of the entrepreneurs. Establishing a business may offer a career prospect to people who have not pursued higher education studies after school, nor have acquired other specialised skills. Alternatively, it may be a "plan B" for people who have not managed to get a job in the sector they have specialised in and face long-term unemployment. Beyond the educational and professional background, the family environment also proves to be a significant factor for engaging in entrepreneurship, especially for people whose relatives already own a business or have similar professional experience. Last but not least, it is quite common for people (regardless of their educational, professional and family background) to initiate their own business - despite the high risk entailed, especially after the outburst of the economic crisis - seeking a way out of professional stagnation, low-paid work and job insecurity.

With regards to the locational choices of entrepreneurs, interviewees revealed a wide range of motivating factors for establishing their business in the specific neighbourhood of the city. These motivating factors vary from individual motivations and perceptions of the neighbourhood to certain functional attributes of the built environment, economic opportunities in the local market, even the aesthetics of the existing building stock. One of the most important individual motivations is emotional attachment to the neighbourhood, especially for people who were born and raised there or have been residents in the area for a long period of their life. In this case, the already established social networks are of particular importance, since

family, friends and co-ethnics usually offer start-up financial support to entrepreneurs, share with them information and professional knowledge, and constitute an initial customer base for their businesses. Beyond human capital, the functional, economic and aesthetic attributes of the built environment also constitute motivating factors for entrepreneurs to set up their business in the neighbourhood. In fact, most of the interviewed entrepreneurs were attracted by the proximity and good connection of Akadimia Platonos to the city centre and other neighbourhoods of Athens, the availability of public infrastructure, the affordability of rental prices, but also the aesthetic quality of the existing building stock, such as the particular architecture of former industrial buildings. Such functional, economic and aesthetic attributes of the neighbourhood create favourable conditions for the establishment and development of entrepreneurship or, in other words, for the creation of a vibrant local market that is attractive both to the professionals and the customers.

In comparison with the clear importance of the human capital and of the functional, economic and aesthetic attributes of the neighbourhood, diversity only partly constitutes a motivating factor for entrepreneurs to set up their business in Akadimia Platonos. In fact, when entrepreneurs draw their initial business plan, diversity in the neighbourhood is perceived in multiple and ambiguous ways. This depends on different aspects of diversity, namely diversity in professional activities, social diversity, ethnic diversity and diversity in cultures and lifestyles.

To begin with diversity in professional activities, it usually affects the locational choice of entrepreneurs in a positive way. The high concentration of professionals who engage in many different entrepreneurial activities creates a vibrant and dynamic local market, increases the demand for (new) products and services and favours cooperation between entrepreneurs. This positive perception of diversity in professional activities is clearly reflected in two interviewees' statements:

> *"When we opened this business, ten years ago, the neighbourhood was full of businesses, garages, printing shops, private companies… it was crowded here. And there was no coffee shop to serve all these professionals. That's why we decided to open a coffee shop. And businesses kept increasing". (male, 26, Greek, coffee shop-snack bar)*

> *"Diversity in activities was a motivating factor for me… the fact that this neighbourhood is 'dirty'. […] I mean it is not a posh or mono-functional neighbourhood. One can find eve-*

rything here: industries, merchants, wholesalers, logistics, jobs related to mine". (male, 30, Greek, engineering office)

However, there are certain limits to the positive perception of diversity stressed above. When diversity in professional activities is absolutely unregulated, it is considered to be a negative condition for the development of entrepreneurship. Especially entrepreneurs engaged in commerce, everyday and specialised services have a negative view on the unlimited mix of professional activities in the neighbourhood. They would rather have some kind of small-scale zoning or clustering of similar and complementary businesses. The owner of an engineering office explicitly describes this ambiguous impact of diversity in professional activities:

"I would prefer it if there was a kind of order. If there was a specific place for each activity, where similar professionals could concentrate and collaborate, a place of reference. But everything is dispersed here: engineering offices, butcher shops, clothing, crafts… We'd rather find a fine balance". (male, 34, Greek, engineering office)

While diversity in professional activities constitutes an attractive condition for the establishment of businesses in the study area - at least to a certain extent -, the social diversity of the neighbourhood does not seem to be a motivating factor for the locational choices of entrepreneurs. Although Akadimia Platonos is a socially diverse neighbourhood and local businesses serve a large and diverse clientele, the entrepreneurs mostly target what they call "high-quality" customers, namely individuals and households of medium or high income. In this sense, they are rather indifferent to the coexistence of individuals and households of diverse socio-economic backgrounds in the neighbourhood. Instead, they would rather set up their business in a socially homogeneous neighbourhood - obviously a wealthier one - which would increase local demand and, thus, turnover and profits for their businesses. However, Akadimia Platonos is no such case. In fact, during the last decades, businesses in the neighbourhood have been facing a decreasing local demand, losing a significant part of the commonly desired "high quality" clientele. As already mentioned, this is due to certain demographic and economic changes which took place recently. First of all, in the late 1990s and early 2000s, a significant part of the local middle and upper classes left the neighbourhood, seeking better living conditions in the suburbs. And, secondly, after the outburst of the economic crisis back in 2007,

austerity measures further reduced the incomes of most of the households remaining in the neighbourhood.

However, a reverse demographic and economic change has been taking place in the neighbourhood during the last few years and is being positively perceived by local entrepreneurs. This change concerns the increasing diversification in the age profile of the neighbourhood population, with more and more young people settling in Akadimia Platonos. Especially for entrepreneurs engaged in leisure activities such as coffee shops, bars and restaurants or cultural and sports centres, the arrival of newcomers of young age in the neighbourhood is clearly a motivating factor to adapt their professional activities or establish new ones in order to meet the needs of this active population group that consumes more than others. This is exactly the case for the owner of a coffee shop and restaurant:

> *"We try to attract young customers, especially since residents in Akadimia Platonos are changing. New and young people settle here and we'd like to integrate them into our clientele [...] To this end, we spent money for renovation works, changed the menu, fixed live music events and, thus, increased our profits. […] We also extended our opening hours. From morning to evening hours or at weekends, we serve different types of customers, from older to younger people. […] We also worked much for the advertisement of the business, we now have our own website and page on Facebook". (female, 38, Greek, coffee shop-restaurant)*

Compared with diversity in professional activities and diversity in the social characteristics of residents in Akadimia Platonos, ethnic diversity is the one most ambiguously perceived in the neighbourhood. The presence of immigrants of various nationalities is viewed both ways - positively and negatively - depending mostly, but not exclusively, on the interviewees' ethnic origin. Migrant entrepreneurs, for instance, rely significantly on migrant population to establish their business in the neighbourhood and assure their clientele there. However, they mostly rely on the presence of co-ethnics and not necessarily on the presence of immigrants of all different ethnic origins. In this sense, migrant entrepreneurs are rather indifferent to ethnic diversity. A Pakistani owner of a grocery store clearly described what immigrants he relied and keeps relying on for the establishment and operation of his business:

"I opened this grocery store in Akadimia Platonos because I have been living here for the past 14 years and I have relatives here and friends, both Greeks and Pakistanis, who could help me with the business […] if I need something I call them and they come immediately […] almost every year we paint the walls […] people know me here and they come to me to do their shopping". (male, 31, Pakistani, grocery store)

As for Greek entrepreneurs, their views on ethnic diversity are divided. Some distance themselves from stereotypes (re)produced by the media and linking the presence of immigrants in the neighbourhood to insecurity and degradation. In this case, ethnic diversity is seen neither as a positive nor as a negative condition for the establishment and operation of businesses. However, for another part of Greek entrepreneurs, immigrants are considered "bad customers" and, thus, collectively responsible for the economic decline of local businesses. In this sense, they would rather initiate their business in an ethnically homogeneous neighbourhood - obviously inhabited only by Greeks -. The (Greek) owner of a grocery store gives a commonly shared opinion on migrant customers:

"Immigrants do not support us. Can a Pakistani support my business? They live all together in fifty square metres, twenty persons in less than fifty square metres… they buy only the basics and if some of them opens a business they all do their shopping there". (female, 39, Greek, grocery store)

Directly related to the social and ethnic diversity in the neighbourhood, a last aspect of urban diversity discussed with local entrepreneurs is diversity in cultures and lifestyles. According to the interviewees, different cultures and lifestyles raise important difficulties in the way that entrepreneurs are expected to plan the products and services of their business so as to meet all different consumer habits, needs and tastes. This is true both for Greek and migrant entrepreneurs, active in various business sectors, such as a Greek civil engineer and an Albanian owner of a hair salon and jewellery shop:

"This extreme diversity in ethnic groups and the mobility of these groups are not very helpful for a businessman to have a regular clientele with specific needs". (male, 34, Greek, engineering office)

"Our customers vary from people who are unemployed to people who may still earn 2,000 euros per month. […] It is difficult for the entrepreneur to plan services for five different social classes. […] The same thing goes for different ethnic groups. You don't know the preferences, the tastes, the habits… It is very difficult to deal with this, it needs time and experience". (male, 45, Albanian, hair salon-jewellery shop)

3.2 Diversity as a key factor for the economic performance of businesses

Beyond the role that urban diversity plays in the establishment and development of entrepreneurship in Akadimia Platonos, its effects on the economic performance of local businesses are also of particular importance, especially in the context of a long and continuing economic crisis. With closed businesses in the study area reaching almost 50%, it is crucial to find out if diversity is a key factor that favours or hinders entrepreneurial success.

According to the interviewed entrepreneurs, the decades preceding the crisis - namely the 1980s, 1990s and early 2000s - marked a period of remarkable upward economic performance. The most recent and last period of high economic prosperity was the period around the 2004 Olympic Games, especially for businesses related to the construction sector. Through the upward economic performance of their business, entrepreneurs managed to improve their social status and the living standards of their family. For instance, they bore the cost of their children's studies, bought a car, moved to a bigger apartment or purchased their own. This social and residential upgrade was experienced not only by Greek, but also by migrant entrepreneurs active in various business sectors.

However, since the crisis broke out back in 2007, the economic performance of most local businesses has dramatically decreased. Successive cuts in wages and pensions, as well as the increase of unemployment, have led to a drastic decrease in the purchasing power of households and, therefore, in the turnover and profits of businesses, primarily those active in commercial activities and everyday services, but also in the construction sector, culture, education, sports and health. Along with the decline of turnover and profits, which varies from 40% to 90%, there have also been significant increases in the fixed costs of businesses, such as taxes, insurance contributions and operating expenses.

All interviewed entrepreneurs agree that the economic crisis is the main reason for the drastic decrease in the turnover and profits of their businesses. They also agree that the economic performance of businesses is deeply affected by the overall economic developments in Greece, as well as the general political instability, which cause a widespread sense of insecurity to the consuming public.

Nevertheless, when it comes to the role of urban diversity in the economic performance of businesses, opinions expressed by the interviewed entrepreneurs are divided, and perceptions differ depending on the aspect of diversity being discussed.

With regards to social diversity in the neighbourhood, it is clear that most of the local businesses benefit from the socially diverse clientele, since they manage to gain customers of all different incomes, customers of low to higher educational level, children, young and elderly people, women and men, both able-bodied and persons with disabilities. This is true for various types of local businesses, from those active in commerce, everyday and more specialised services to those involved in creative and innovative activities:

> *"Akadimia Platonos has always been home to a rich social mosaic: mainly lower and middle class households but also upper classes. Until recently, the latter constituted about 20% of my clientele. Every now and then, there would also be some rich businessmen". (male, 52, Greek, clocks and jewellery shop)*

> *"About 80% of our customers are residents in the neighbourhood. […] Mostly middle class, but also poor people who pay for a dance class for their children despite their economic difficulties. […] As for the ages of our customers, there are children aged 3 to adults aged more than 60". (male, 42, Greek, private dance school)*

> *"We also have classes for disabled people and other 'minorities' - a word that I don't really like -". (female, 40, Greek, multi-purpose art association)*

Only a few local businesses have a narrow and relatively homogeneous customer base, although settled in a socially diverse neighbourhood. Paradoxically, this is the case for certain cultural businesses (such as theatres) which are generally expected to attract a wide and diverse clientele. Never-

theless, they actually attract customers of a very specific social and ethnic profile, as explained by the owner of a multi-purpose art space:

> *"Compared to other theatres, we address a younger audience. […] I think that ages vary from 35 to 55. […] According to a short research we conducted, our customers are usually Greek, highly educated, people of middle income, though our prices are not high. […] Our customers barely include people living in Akadimia Platonos. I have met people in the neighbourhood who told me they did not even know this art space exists. […] People living in this neighbourhood are not used to going to the theatre. They choose other forms of entertainment". (female, 35, Greek, multi-purpose art space)*

With the exception of certain cultural spaces, social diversity in Akadimia Platonos has an admittedly positive impact on the economic performance of local businesses. On the contrary, ethnic diversity in the neighbourhood is ambiguously perceived by the interviewed entrepreneurs. So, the presence of immigrants, along with the current economic crisis, is often perceived as one of the main factors for the economic decline of businesses, as well as for the overall degradation of the neighbourhood. In fact, for a significant part of the interviewed entrepreneurs, immigrants are not considered "good customers", on the grounds that they often face economic difficulties, do their utmost to save money instead of consuming and prefer shopping at businesses owned by their co-ethnics. Only Albanians occasionally escape this bad reputation, considered the "best foreign customers", since they constitute the largest, most integrated and well-paid migrant population in the country. However, for another part of the interviewed entrepreneurs, especially in the midst of the crisis, immigrants are considered "reliable customers", on the grounds that they are used to saving money and are experienced in handling situations of economic instability. Opinions are divided, usually depending on the ethnic background of the interviewed entrepreneurs, as reflected in the statements of a Greek owner of a grocery store and an Albanian tailor:

> *"Apart from the crisis, a lot of immigrants have settled here. What can they buy? They save money and send it back to their country. […] They work in Greece but spend their money abroad. […] Moreover, they support their compatriots' businesses. […] They only come to shop at my store to get rid of counterfeit banknotes". (female, 39, Greek, grocery store)*

"Many customers have left me clothes to repair and they never came to pay and take them back. Usually, they are Greeks. […] It is rare for immigrants to miscalculate, but not for Greeks. Greeks have not yet realised their economic situation and have difficulties in handling the crisis. On the contrary, immigrants are used to economic planning, planning a simple living". (female, 47, Albanian, tailor)

While some Greek entrepreneurs consider immigrants to "be the problem", migrant entrepreneurs actually "face problems" beyond the current economic crisis that deeply affected the economic performance of businesses regardless of their owners' ethnic origin. For migrant entrepreneurs, the decline in turnover and profits is also due to racist attacks provoked by rioting members of the far-right Golden Dawn party. Incidents of racist violence, such as destroying or burning down migrant businesses, spread fear not only to migrant entrepreneurs, but also to customers, with negative results like those described by a Pakistani owner of a grocery store:

"The year 2012 was a difficult year, in general. Not only for my own business. Members of the Golden Dawn party started riots, came and destroyed my store. They broke the window and it was difficult […] People stopped going out, they were afraid. Everyone was afraid in the neighbourhood. And a lot of my compatriots went back to Pakistan out of fear". (male, 31, Pakistani, grocery store)

However, racist hate and the rejection of immigrants constitute only one side of the coin. Along with negative views on the neighbourhood's ethnic diversity, positive feelings are also expressed by Greek entrepreneurs who are active in various types of businesses. For instance, a (Greek) owner of a local sport association talks about immigrant integration and peaceful interethnic coexistence not as a theoretical concept, but as an everyday reality:

"We have many athletes who are immigrants. This sport association is not reserved to Greeks, though I try to keep a certain (ethnic) balance. […] Most of our foreign athletes are Albanians but we also have a lot of Afghans, Egyptians, Romanians, etc. […] We have all been together for years and I forget that they are foreigners, I consider them to be Greeks.

Because we speak the same language, we have similarities, we integrated them". (male, 42, Greek, sport association)

Despite existing negative views on the presence of immigrants, it seems that ethnic diversity in the neighbourhood does not necessarily raise difficulties in the development of friendly interethnic relationships; nor is it a problem for the operation and economic performance of businesses. In fact, most of the interviewees claimed that friendly relationships among entrepreneurs, regardless of their ethnic origin, create a favourable business milieu of professional solidarity and mutual support. Greek and migrant entrepreneurs recommend one another to their customers, buy products and order supplies from each other's business and, thus, increase the economic performance of their businesses. In this sense, the presence of migrant entrepreneurs in the neighbourhood emerges as a key factor for a friendly, lively and dynamic local market, and not as a threat to the economic performance of local (Greek) businesses. This positive perception of ethnic diversity is clearly reflected in the statement of a Greek owner of a clothing store who competes with Chinese entrepreneurs active in the same business sector:

"We believe that it's good when the market is lively. And it's the same for us if this is because of our business or because of another. The important thing is that there are customers walking around. […] Near our business, there is another store selling Chinese clothes, as well as many similar businesses, Greek and migrant. They all have a positive impact on our clientele. Chinese businesses have lower prices than ours. But their customers also come to us". (male, 60, Greek, men's XL clothing store)

Conclusions

Discussing with entrepreneurs in the Athens neighbourhood of Akadimia Platonos fulfilled the initial purpose of this paper of adding empirical evidence - at the micro level - regarding the relationship between urban diversity and entrepreneurship. In fact, discussing with entrepreneurs revealed multiple perceptions of urban diversity, firstly as motivation for establishing a business in a specific neighbourhood of the city and, secondly, as a key factor for the economic performance of businesses.

To draw a general conclusion stemming from the interviews, it seems that there is no common perception of urban diversity and its role in the establishment, development and competitiveness of entrepreneurship. Instead, various perceptions of urban diversity emerge, usually contrasting and ambiguous. Perceptions differ depending on the individual profile of interviewees, on the type of business they engage in and, mostly, on the aspect of diversity being discussed.

So, according to the interviewed entrepreneurs, diversity is only partially a motivating factor for establishing a business in the specific neighbourhood. Diversity in professional activities, for instance, is considered to create an attractive local market and, thus, is clearly viewed as a key driver for the establishment of entrepreneurial activities. However, this does not also extend to the social diversity of the neighbourhood. Entrepreneurs mostly target "high-quality" clientele, being rather indifferent towards households of diverse socio-economic background. The same goes for ethnic diversity. A considerable number of Greek entrepreneurs consider immigrants to be "bad customers", and would rather initiate their business in a less ethnically diverse neighbourhood of the city - obviously inhabited mostly by Greeks -. As for migrant entrepreneurs, they significantly rely on the presence of co-ethnics to initiate their business in the neighbourhood, but not necessarily on the presence of immigrants of different ethnic origins. Finally, diversity in cultures and lifestyles may not be a deterrent factor for the locational choices of entrepreneurs, but it admittedly raises difficulties to entrepreneurs when planning the products and services of their businesses so as to meet all different customer needs and tastes.

Ambiguities similar to those presented above are also observed in the perception of urban diversity as a key factor for the economic performance of businesses. Again, diversity in professional activities is clearly perceived as beneficial for profits, since it creates a vibrant and dynamic local market. But social and ethnic diversity are not always perceived as such. The majority of businesses actually benefit from the socially and ethnically diverse local clientele, gaining customers of all different ethnic origins, incomes, ages, educational levels etc. However, there are businesses that target a narrower, socially and ethnically homogeneous clientele, excluding immigrants, elderly people, persons of low income and low educational level. Especially immigrants are often not welcome in the neighbourhood, neither as customers nor as entrepreneurs, considered to be collectively responsible for the economic decline in turnover and profits of local businesses.

Considering all different views expressed by local entrepreneurs in a central neighbourhood of Athens, it is clear that urban diversity may have both positive and negative effects on the establishment, development and

competitiveness of entrepreneurship; it may favour entrepreneurial engagement and spur economic benefits, but may also raise serious difficulties and stimulate conflicts. This major remark on the multiple effects of urban diversity on entrepreneurship is in line with research findings that have already emerged in the literature regarding several other cities around the world.

Eventually, urban diversity emerges as an ambivalent factor (positive, negative or both) for the development of entrepreneurship, constituting part of the "entrepreneurship capital" of cities. Especially in the case of Athens, which is deeply affected by a long and ongoing economic crisis, it is crucial to further explore the way in which urban diversity could have a positive impact on entrepreneurship. Moreover, as already suggested by many scholars, the role of urban diversity should be opened up to public debate and put on the political agenda. Especially against the background of an increasingly diverse urban environment, addressing urban diversity should be set as an explicit priority and strategic target for urban policies, instead of being only a rhetoric scheme. However, it is important that urban diversity be addressed as part of the "dynamic complexity" of cities - a term coined by Jane Jacobs. Thus, the aim of addressing urban diversity would not be to find a universal way of dealing with it, a goal which is, anyway, unattainable; but to better understand and adequately address all its multiple, contrasting and ambiguous effects on entrepreneurship and everyday life, such as those revealed in this paper.

References

Aldrich, H.E., & Zimmer, C. (1986). Entrepreneurship through social networks. In D.L. Sexton & R.W. Smilor (Eds.), *The art and science of entrepreneurship* (pp. 3-23). New York, Ballinger.

Alesina, A. & La Ferrara, E. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature,* 43(3), 762-800.

Alexandre-Leclaire, L. (2014). Diversity as a motive for entrepreneurship?: The case of gender, culture and ethnicity. *Journal of Innovation Economics & Management*, 14(2). 157-175.

Armington, C. & Acs, Z.J. (2002). The Determinants of Regional Variation in New Firm Formation. *Regional Studies*, 36(1), 33-45.

Audretsch, D. & Keilbach, M. (2004). Entrepreneurship Capital and Economic Performance. *Regional Studies*, 38(8), 949-959.

Balampanidis, D., Belavilas, N., Gleni, V., Polyzou, I. & Prentou, P. (2013). The effects of crisis on the commercial activities in central neighborhoods of Athens

and Piraeus. -Resistance and dynamics. In *Changes and redefinitions of space in Greek crisis* (pp. 102-110). Volos, University Press of Thessaly. (in Greek)
Balampanidis, D. & Polyzos, I. (2016). Migrants' settlement in two central neighborhoods of Athens. An analytical framework for urban transformations and interethnic coexistence. *CITY. Analysis of urban trends, culture, theory, policy, action,* 20(1), 75-90.
Balampanidis, D., Souliotis, N., & Maloutas, T. (2016). *Fieldwork entrepreneurs, Athens (Greece),* Athens, National Centre for Social Research (EKKE).
Basu, A. (2004). Entrepreneurial aspirations among family business owners. *International Journal of Entrepreneurial Behaviour & Research*, 10(1/2), 12-33.
Baycan-Levent, T., Gülümser, A.A., Kundak, S., Nijkamp, P. & Sahin, M. (2003). Diversity and ethnic entrepreneurship: Dialogue through exchanges in the economic arena. *Sustainable Development in a Diverse World (SUS.DIV) Position paper of research task 4.4.* http://www.ebos.com.cy/susdiv/uploadfiles/RT4_4_PP_Tuzin.pdf [Last Accessed: 1st March 2017].
Blanchflower, D.G. (2004). Self-employment: More may not be better. *Swedish Economic Policy Review*, 11, 15-73.
Bodaar, A. & Rath, J. (2005). Cities, diversity and public space. *Metropolis World Bulletin*, 5, 3-5.
Bonacich, E. (1973). A theory of middleman minorities. *American Sociological Review,* 38(5), 583-594.
Boschma, R.A. & Fritsch, M. (2009). Creative Class and Regional Growth: Empirical Evidence from Seven European Countries. *Economic Geography,* 85(4), 391-423.
Cavounidis, J. (2002). Migration in Southern Europe and the Case of Greece. *International Migration,* 40(1), 45-70.
Churchill, S.A. (2017). Fractionalization, entrepreneurship, and the institutional environment for entrepreneurship. *Small Business Economics*, 48(3), 577-597.
EKKE-ESYE (National Centre for Social Research-National Statistical Service of Greece) (2005). *Census data Panorama, 1991–2001. Data base and mapping application in the Institute of Urban and Rural Sociology.* Athens, National Centre for Social Research (EKKE). (in Greek)
ELSTAT (Hellenic Statistical Authority) (2017). *Turnover Index in Retail Trade (2010=100.0) (Provisional Data) (January 2000 - November 2016).* http://www.statistics.gr/en/statistics/-/publication/DKT39/- [Last Accessed: 1st March 2017].
Emmanouel, D. (2006). Segregation, polarisation and inequalities in the geography of Athens: The role of real estate mechanisms and urban development (1980-2000). In T. Maloutas, D. Emmanouil & M. Padelidou-Malouta (Eds.), *Athens. Social structures, practices and perceptions: New parameters and changing trends 1980-2000* (pp. 265-312). Athens, National Centre for Social Research (EKKE). (in Greek)

Eraydin, A., Tasan-Kok, T. & Vranken, J. (2010). Diversity matters: Immigrant entrepreneurship and contribution of different forms of social integration in economic performance of cities. *European Planning Studies*, 18, 521-543.

Fainstein, S. (2005). Cities and diversity. Should we want it? Can we plan for it?. *Urban Affairs Review*, 41(1), 3-19.

Florida, R. (2002). *The rise of the creative class: And how it's transforming work, leisure, community and everyday life*. New York, Basic Books.

Freytag, A. & Thurik, R. (2007). Entrepreneurship and its determinants in a cross-country setting. *Journal of Evolutionary Economics*, 17(2), 117-131.

Greve, A. (1995). Networks and entrepreneurship – An analysis of social relations, occupational background, and use of contacts during the establishment process. *Scandinavian Journal of Management*, 11, 1-24.

Grilo, I. & Thurik, R. (2008). Determinants of entrepreneurial engagement levels in Europe and the US. *Industrial and Corporate Change*, 17(6), 1113-1145.

Granovetter, M. (1985). Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 3, 481-510.

Hatziprokopiou, P. & Frangopoulos, Y. (2016). Migrant economies and everyday spaces in Athens in times of crisis. *CITY. Analysis of urban trends, culture, theory, policy, action,* 20(1), 61-74.

Hoang, H. & Antoncic, B. (2003). Network-based research in entrepreneurship: A critical review. *Journal of Business Venturing*, 18, 165-187.

INEMY-ESEE (Institute of Commerce and Services of National Confederation of Hellenic Commerce) (2015). *Research on closed businesses along central commercial roads. City center of Athens and Piraeus*. Athens, INEMY-ESEE. (in Greek)

Jenssen, J.I. (2001). Social networks, resources and entrepreneurship. *International Journal of Entrepreneurship and Innovation*, 2, 103-109.

Kandylis, G., Arapoglou, V. & Maloutas, T. (2007). Immigration and the dipole 'Competitiveness – Social Cohesion' in Athens. *Geographies,* 13, 35-54. (in Greek)

Kandylis, G., Maloutas, T. & Sayas, J. (2012). Immigration, inequality and diversity: socio-ethnic hierarchy and spatial organization in Athens, Greece. *European Urban and Regional Studies*, 19, 267-286.

Kemeny, T. (2012). Cultural diversity, institutions, and urban economic performance. *Environment and Planning A*, 44, 2134-2152.

Kloosterman, R. & Rath, J. (2001). Immigrant entrepreneurs in advanced economies: Mixed embeddedness further explored. *Journal of Ethnic and Migration Studies*, 27(2), 189-201.

Kloosterman, R., van der Leun, J. & Rath, J. (1999). Mixed Embeddedness: (In)formal Economic Activities and Immigrant Businesses in the Netherlands. *International Journal of Urban and Regional Research*, 23(2), 252-266.

Klyver, K., Hindle, K. & Meyer, D. (2008). Influence of social network structure on entrepreneurship participation – A study of 20 national cultures. *International Entrepreneurship and management Journal,* 4(3), 331-347.

Leadbeater, C. (2008). *The Difference Dividend. Why immigration is vital to innovation*. London, NESTA.

Lianos, T., & Psiridou, A. (2013). Immigrants' entrepreneurship in Greece. In T. Cavounidi, A. Condis, T. Lianos & R. Fakiolas (Eds.), *Immigration to Greece: Experience, Policies, Perspectives* (pp. 210-227). Athens, IMEPO. (in Greek)

Mavrommatis, G. (2008). Forms of Ethnic Entrepreneurship in Athens. In T. Cavounidi, A. Condis, T. Lianos & R. Fakiolas (Eds.), *Immigration to Greece: Experience, Policies, Perspectives* (228-247). Athens, IMEPO. (in Greek)

Nathan, M. (2011). The Economics of Super-Diversity: Findings from British Cities, 2001-2006. *SERC Discussion Paper 68*. London, Spatial Economics Research Centre (SERC).

Nathan, M. (2015). After Florida: Towards an economics of diversity. *European Urban and Regional Studies*, 22(1), 3-19.

Ottaviano, G.I.P. & Peri, G. (2006). The economic value of cultural diversity: evidence from US cities. *Journal of Economic Geography,* 6, 9-44.

Page, S.E. (2007). *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*. Princeton, Princeton University Press.

Pichler, F. & Wallace, C. (2007). Patterns of Formal and Informal Social Capital in Europe. *European Sociological Review*, 23(4), 423-435.

Portes, A. (1995). *The economic sociology of immigration. Essays on networks, ethnicity and entrepreneurship*. New York, Russel Sage Foundation.

Portes, A. & Sensenbrenner, J. (1993). Embeddedness and Immigration: Notes on the Social Determinants of Economic Action. *The American Journal of Sociology,* 98(6), 1320-1350.

Putnam, R.D. (2007). E Pluribus Unum: Diversity and Community in the Twenty-first Century. *Scandinavian Political Studies,* 30(2), 137-174.

Ripolles, M. & Blesa, A. (2005). Personal networks as fosterers of entrepreneurial orientation in new ventures. *International Journal of Entrepreneurship and Innovation*, 6, 239-248.

Saiz, A. (2003). Room in the kitchen for the melting pot: Immigration and rental prices. *The Review of Economics and Statistics,* 85(3), 502-521.

Saxenian, A.L. & Sabel, C. (2008). Venture Capital in the 'Periphery': The New Argonauts, Global Search and Local Institution-Building. *Economic Geography,* 84(4), 379-394.

Schutjens, V. & Völker, B. (2010). Space and Social Capital: The Degree of Locality in Entrepreneurs' Contacts and its Consequences for Firm Success. *European Planning Studies,* 18(6), 941-963.

Serraos, K., Greve, T., Asprogerakas, E., Balampanidis, D., & Chani, A. (2016). Athens, a capital in crisis: tracing the socio-spatial impacts". In J. Knieling & F. Othengrafen (Eds.), *Cities in crisis. Socio-spatial impacts of the economic crisis in Southern European cities* (pp. 116-138). London and New York, Routledge.

Sparber, C. (2010). Racial Diversity and Macroeconomic Productivity across US States and Cities. *Regional Studies,* 44(1), 71-85.

Syrett, S. & Sepulveda, L. (2011). Realising the diversity dividend: population diversity and urban economic development. *Environment and Planning A,* 43, 487-504.

Syrett, S. & Sepulveda, L. (2012). Urban governance and economic development in the diverse city. *European Urban and Regional Studies,* 19(3), 238-253.

Tasan-Kok, T., & Vranken, J. (2008). From survival to competition? The socio-spatial evolution of immigrant entrepreneurs in Antwerp. In P. Ache, H.T. Andersen, T. Maloutas, M. Raco & T. Tasan-Kok (Eds.), *Cities between Competitiveness and Cohesion: Discourses, Realities and Implementation* (pp. 151-168). Dordrecht, Springer.

Taylor, C. (2004). *Modern Social Imaginaries*. Durham, Duke University Press.

Tsiganou, I. (2013). Entrepreneurship, 'Dangers' and Competitiveness. In T. Maloutas, G. Kandylis, M. Petrou & N. Souliotis (Eds.), *The city centre of Athens as political issue* (pp. 145-167). Athens, National Centre for Social Research (EKKE) and Harokopio University (HUA). (in Greek)

Vaiou, D. (2014). Tracing aspects of the Greek crisis in Athens: Putting women in the picture. *European Urban and Regional Studies*. Doi: 10.1177/0969776414523802.

Vertovec, S. (2012). Diversity and the Social Imaginary. *European Journal of Sociology,* 53(3), 287-312.

Völker, B., & Flap, H. (2004). Social networks and performance at work. A study of returns to social capital while doing one's job. In H. Flap & B. Völker (Eds.), *Creation and Returns of Social Capital. Theory, Research and Measurement* (pp. 172-195). London, Routledge.

Waldinger, R. (2003). Networks and niches: the continuing significance of ethnic connections. In L. Glenn, T. Modood & S. Teles (Eds.), *Race, Ethnicity and Social Mobility in the US and UK* (pp. 342-362). New York, Cambridge University Press.

Mapping the environmental pressure due to economic factors. The case of Italian coastal municipalities

di Marco Modica*, Roberto Zoboli** e Elena Pagliarino***

Abstract

In this paper, we quantitatively characterize the sector specialization of the coastal municipalities that may affect the environment of the Italian coastal municipalities. We first quantified settlement pressure on the Italian coasts, then we provide an analysis of economic specializations by sectors of coastal municipalities. Finally, we develop a more specific analysis on the specialization and dependence of coastal municipalities. Focusing on two specific groups of economic sectors: i) those that depend on the sea as the primary source input and ii) those that do not depend on the sea but that have high environmental pressures. We provide evidence of the relationship between the two groups of sectors i.e. 'marine' sectors and. 'high pressure' sectors in coastal municipalities
Keywords: Coastal environment; Integrated Coastal Management; Territorial disparities.
JEL Classification: Q25; Q51; Q56; R11.

Mappatura della pressione ambientale dovuta a fattori economici. Il caso dei comuni costieri italiani

Sommario

In questo articolo, caratterizziamo quantitativamente le principali specializzazione settoriale dei comuni costieri che influenzano l'ambiente litoraneo. Prima si quantificano le pressioni di insediamento sulle coste italiane, successivamente si fornisce un'analisi delle specializzazioni economiche a livello settoriale dei comuni costieri. Infine, si sviluppa un'analisi sulla specializzazione e la dipendenza dei comuni costieri dall'ambiente. In particolare, ci concentriamo su due gruppi specifici di settori economici: i) quelli che dipendono dal mare come input primario e ii) quelli che non dipendono dal mare, ma con elevate pressioni ambientali. In questo modo forniamo la prova della relazione tra i due gruppi di settori, cioè i "marini" e quelli "ad alta pressione" nei comuni costieri.
Parole Chiave: Ambiente costiero; Gestione costiera integrata; Disparità territoriali.
Classificazione JEL: Q25; Q51; Q56; R11.

* Istituto di Ricerche sulla Crescita Economica e Sostenibile, IRCrES-CNR, Via Corti, 12, Milano , E-mail: marco.modicai@ircres.cnr.it.

** Facoltà di Scienze Politiche e Sociali, Università Cattolica, Largo Gemelli, 1, Milano, E-mail: roberto.zoboli@unicatt.it.

*** Istituto di Ricerche sulla Crescita Economica e Sostenibile, IRCrES-CNR, Via Real Collegio 30 - 10024 Moncalieri, Italy; E-mail:: elena.pagliarino@ircres.cnr.it

Introduction

Coastal municipalities in Italy are 645, less than 8% compared to the 8,093 Italian municipalities (2011).[1] They cover an area of 43,121 km2, which represents 14.2% of the national territory (with an average area of about 67 km2 compared to a national average of 37 km2). Furthermore, in coastal municipalities resides a population of 16.6 million of inhabitants in 2011, accounting for about 28% of the Italian population (Table 1). The coastal municipalities have therefore a very high average population density, equal to 387 inhabitants per km2 (against a national average of 197 inhabitants per km2). This evidence immediately suggests a high human pressure on coastal areas resulting from longstanding economic and demographic Italian development.

Despite this large presence of human activities in the coastal areas, all over the world, we note a limited availability, at least to our knowledge, of research on coastal integrated management, at national or supranational level. Indeed, research on coastal integrated management is generally referred to specific case studies (e.g. Cantasano and Pellicone, 2014; Niavis, et al. 2017).

This work, instead, aims at providing a useful tool for a more aggregate level of analysis of the relationship between local economy and the in/direct pressure on the sea. The main goal of the paper is to provide a possibly complete and updated map on the characteristics of the Italian coastal municipalities and economic areas they belong to. It also provides consistent and clear indications on the human pressure and the possible environmental pressures on the coastal areas of the regions object of study. In this way, this paper could be a useful tool for implementing policies and coastal integrated management strategies (Cantasano and Pellicone, 2014; Olsen, 2003) that reduce the environmental pressures while preserving the economic activities related to ‘marine’ activities.

In order to reach the goal of the paper we need to highlight that Italian coastal municipalities include some large cities, which could bias the aggregate data. Then, to be more confident about the effective human pressure exerted on the Italian coasts, Table 1 shows the data on population density excluding the cities (coastal and non-coastal) with more than 500,000 inhabitants. In the case of coastal municipalities, it comes to Genoa, Rome, Naples and Palermo.

[1] Coastal municipalities are those defined as 'litoranei' by Istat, meaning those whose borders are touched by the sea.

In this way, excluding the large cities, our descriptive statistics denote very few changes. In fact, the coastal municipalities without the big cities occupy 13.7% of the Italian territory, with 22.6% of the population (11.8 million inhabitants) living there, which leads to a population density of about 287 inhabitants / km2 while the national average, calculated with homogenous standard, is of 174 inhabitants / km2.
At the same time, the change in population density between 2001 and 2011 (excluding the large cities) is higher (8 inhabitants / km2) compared to the figure that includes the big cities, a sign that the pressure of settlement on the four large coastal cities has slowed more than in coastal municipalities. It also should be noted that the four coastal cities excluded account for around 4.8 million inhabitants, almost 29% of all coastal municipalities, and this has a complex influence on the economic characterization of coastal municipalities, in particular in the case of Lazio (Rome) and Campania (Naples). Therefore, even excluding the larger coastal cities, the relative density of the coastal municipalities is still very high compared to the national average density (both with and without the big cities) and it is still increasing.

Tab. 1 Italian coastal municipalities in 2011 (Elaboration from ISTAT).

	Number	Size (km^2)	Population	Density (inhab/km^2)	Pop. density change 2011-2001
Italy	8093	302072	59433744	196.75	+8.0
Costal municipalities	645	43121	16671831	386.62	+7.0
% coastal	7.97	14.28	28.05	-	-
*Italy (>500000 inhabs excluded)**	8087	299953	52496335	173.8	+8.2
Coastal (>500000 inhabs excluded)	641	41314	11848912	286.8	+7.9
% coastal (>500000 inhabs excluded)	7.92	13.77	22.57	-	-

* 4 coastal municipalities (Genoa, Naples, Palermo and Rome), and 2 non-coastal (Milan and Turin)

The Italian coasts, then, are subject to strong human pressures with respect to the non-coastal areas and the environmental impact on the coastal and marine territory might be severe (Arto et al., 2012; Barzotto et al., 2014; Bowen and Riley, 2003, Turner, 2000). Furthermore, the resilience of these areas can be reduced (Guarascio et al., 2017; Modica and Reggiani, 2014, 2015) and their vulnerability can be increased (Modica and Zoboli, 2016).[2]

[2] This analysis may be also useful in the evaluation of natural disasters, in particular in the coastal areas and for flood risk (see for more details, Meroni et al., 2016; Modica et al., 2016 and Sterlacchini et al., 2016)

Nonetheless, we are confident that the presence of large cities do not bias our analysis. Then, as we said above, the goal of the analysis is to provide a characterization of the overall Italian coastal municipalities (of the selected regions) allowing to highlight their specialization in terms of economic activities and economic dependence on marine production sectors (i.e. sectors that are closely dependent on the ecological conditions of the sea because such as fishing). Moreover, we also highlight the environmental pressure due to high pollutant sectors in the coastal municipalities (the so-called high impact sectors). This second group of sectors deserves a more in depth discussion. Indeed, the selection of these sectors has been made up in the light of those economic activities not directly linked to maritime resources, but localized in coastal zones that may exert environmental pressures, on the coast and the sea on the basis of two main arguments: (i) the literature on pressures (see for instance Marin and Mazzanti (2013) and Fadda (2016)); and (ii) an indicator on the CO2 emission intensity, atmospheric pollutant and heavy metals per employed derived by NAMEA. (Moll et al. 2007). NAMEA tables provide the link between environmental pressures (in terms of air emissions) and economic data (e.g. employment, value added, and output)for branches of resident units (see Marin and Mazzanti 2013, for details).[3]

We then will be able to determine the presence of coastal areas that are subjected to a strong environmental pressure due to both the impact caused by the economic sectors depending on the sea and the high impact sectors and we can have evidence of a possible interrelation between the two groups of sectors.[4]

The data used in this analysis come from the Census of Industries and Services developed by ISTAT in 2011. These data provide a very detailed information at municipality scale on the characteristic of firms and employments that could be sufficient to characterize municipalities in terms of productive structure. The Census data are available at the municipal level for 352 sectors ATECO 2007 (at different levels of aggregation for Sections, Divisions, Groups), by size class (15 classes), by type of legal form (12 types) and other features (Marra and Turcio, 2016). For our purposes, we have used data on total employees for municipality for each sector

[3] In this way, even tough not perfectly, it may be possible to recognize CO2 emissions per each employed at sectoral level. This might be considered then as a proxy for high pollutant sectors (derived as a proxy of CO2 emissions by the sector), even not related directly to sea activities.

[4] See Lucchese et al., 2016; Marin and Modica, 2017 for considerations on economic exposure.

ATECO 2007 (with a selection of 120 areas in the levels of aggregation among the three available).
The analysis is conducted on seven Italian regions: Campania, Emilia Romagna, Friuli-Venezia Giulia, Liguria, Apulia, Sardinia and Veneto. These are the regions that have the most peculiar characteristics throughout the country in terms of length of coastal territory, number of coastal municipalities and ratio between coastal areas and hinterland areas, generalization over the entire Italian territory might be done, however to avoid redundancy we focus only on the above regions.

The paper is organized as follows: Section 2 describes the case studies and the Italian contrast between coastal and non-coastal areas. Section 3 shows the economic dependence on marine resources and areas of high environmental pressure for all the case studies. Section 4 concludes.

1. Study sites and methods

The main population data are available in Table 2 and are based on the data of the Census of population and housing of 2011 carried out by ISTAT. All the regions show higher population density in the coastal municipalities with respect to the hinterland, with the only exception being Veneto where the residential density is not very different from the Italian average: 254.44 inhab./km2 in the coastal municipalities, but it is a bit lower than the value of the non-coastal municipalities (264.80 inhab./km2). In this situation, the anthropological pressure is higher in the hinterland than in the coast (more details in Table 2).

This evidence shows that even if the total surface of coastal municipalities cover only a small part of the entire regional area however, coastal municipalities are usually subject to a strong human pressure greater than that of non-coastal areas. These data, however, reflect only the demographic characteristics. Regarding the economic data, there are some differences: according to the Census of Industries and Services developed by Istat in 2011, in Campania the employees in all sectors were 939,776 (17% of the total regional population), of these, 43% of the total were employed in activities located in coastal municipalities. This indicates an even higher density of employment for coastal municipalities, albeit slightly, with respect to the population density and, therefore, these coastal municipalities could be thought as net attractors of work.

Tab. 2 - Coastal and non-coastal municipalities of the selected regions, 2011.

	Number	Size (km^2)	Population	Density (in-hab/km^2)	Employment
CAMPANIA					
Total	551	13670.95	5766810	421.83	939776
Coastal	60	1748.02	2153646	1214.32	404103
Non Coastal	491	11922.98	3548285	421.83	505673
% Coastal	11	13	38	-	43
Main city		119.02	962003	808270	-
EMILIA ROMAGNA					
Total	348	22452.78	4342135	193.39	1518243
Coastal	14	1523.23	506031	332.21	151824
Non Coastal	334	20929.55	3836104	183.29	1366419
% Coastal	4	7	12	-	10
Main city		140.86	371377	263650	
FRIULI-VENEZIA GIULIA					
Total	218	7862.30	1218985	155.04	80450
Coastal	9	434.30	288490	664.27	18504
Non Coastal	209	7428.01	930495	125.27	61943
% Coastal	4	6	24	-	23
Main city		85.10	202123	237512	
LIGURIA					
Total	235	5416.21	1570694	289.99	433371
Coastal	63	1321.82	1262633	955.22	372700
Non Coastal	172	4094.40	308061	75.23	60671
% Coastal	27	24	80		86
Main city		240.29	586180	2439	
APULIA					
Total	258	19540.90	4052566	207.39	700432
Coastal	67	5993.03	1701712	283.95	316009
Non Coastal	191	13547.87	2350854	173.52	384421
% Coastal	26	31	42	-	45
Main city		117.39	316532	269642	
SARDINIA					
Total	376	24100.02	1639362	68.02	294992
Coastal	70	7452.70	835039	112.05	184472
Non Coastal	306	16647.32	804323	48.32	110520
% Coastal	19	31	51	-	63
Main city		85.45	149883	1763	
VENETO					
Total	581	18407.42	4857210	263.87	1642359
Coastal	11	1654.57	420986	254.44	144527
Non Coastal	570	16752.84	4436224	264.80	1497832
% Coastal	2	9	9	-	8
Main city		415.90	261362	62843	

When looking at the employment the picture is fuzzy, for instance In Emilia-Romagna the employees in all sectors were 1,518,243 (35% of the population), of these, about 10% of the total were employed in businesses located in coastal municipalities. This value still indicates a lower density

of employment than population density and therefore, the coastal municipalities of Emilia Romagna might be seen as net "exporters" of work. These data therefore draw a very heterogeneous picture between regions and it might be considered as a complete taxonomy of the entire country.

1.1. Absolute economic specialization

A first indicator of (absolute) specialization is represented by the percentage of each sector on the employment in the municipality. The main results are presented as the average of all municipalities of a region in Tab.3.

In Campania, considering the major sectors as presented by ATECO 2007, the primary sector (agriculture, forestry and fishing) represents an average of 1,53% of the whole municipal employment in the coastal municipalities with respect to about 0,6% in the non-coastal municipalities. Almost all the manufacturing sectors have a higher average of the percentage of the employment in the non-coastal municipalities than in the coastal ones. On the contrary, most of services have a higher average of the percentage of the employment in the coastal municipalities than in the non-coastal ones. More specifically, the trade represents a very high level of employment in the coastal municipalities (an average of 27,32% with respect to the 26,98% in the non-coastal municipalities), and the same happens in the sector of tourism.

In Emilia Romagna, the primary sector (agriculture, forestry and fishing) represents an average share of 5,99% of the whole municipal employment in the coastal municipalities with respect to about 0,79% in the non-coastal municipalities. These values reach relatively high levels in the sector of fishing (5,74%) with respect to agriculture (0,2%). The manufacturing sectors have in average a higher employment level in non-coastal municipalities than in coastal ones. The services, instead, show higher averages of employment in coastal municipalities, especially for activities linked to tourism.

In Friuli Venezia Giulia, the primary sector (agriculture, forestry and fishing) represents an average share of 6,53% of the whole municipal employment in the coastal municipalities with respect to 1,22% (with very high values for fishing). In the manufacturing sectors, the pattern shows a typical trend similar to other regions with higher averages in non-coastal municipalities.

Tab. 3 - Average share of employment of productive sectors of coastal municipalities of the regions under study and comparison with common non-coastal,%, 2011 for some selected sectors.

Coastal municipalities	Total empl.	A	03	B	C	D	E	F
Campania	**939776**	**0.28**	**0.14**	**0.06**	**16.3**	**0.18**	**1.83**	**10.**
Average for coastal	-	1.54	1.40	0.04	9.79	0.03	1.43	13.1
Average for non-coastal	-	0.64	0.01	0.16	19.71	0.06	1.02	17.22
Emilia Romagna	**1518243**	**0.45**	**0.20**	**0.08**	**29.84**	**0.42**	**0.50**	**8.88**
Average for coastal	-	5.99	5.74	0.04	16.84	0.05	1.00	10.67
Average for non-coastal	-	0.79	0.07	0.16	35.91	0.09	0.61	14.05
Friuli-Venezia Giulia	**352169**	**0.48**	**0.21**	**0.08**	**31.76**	**0.20**	**0.99**	**9.61**
Average for coastal	-	6.53	6.31	0.02	15.13	0.02	0.59	12.50
Average for non-coastal	-	1.22	0.09	0.26	31.91	0.35	0.41	16.06
Liguria	**433371**	**0.25**	**0.17**	**0.08**	**18.11**	**0.29**	**1.37**	**10.30**
Average for cosata		0.60	0.55	0.15	8.64	0.08	0.57	14.35
Average for non-coastal		0.91	0.05	0.24	19.47	0.01	0.22	24.56
Apulia	**700432**	**0.71**	**0.43**	**0.22**	**17.82**	**0.15**	**1.69**	**12.96**
Average for coastal	-	2.08	1.64	0.37	16.64	0.07	0.82	13.75
Average for non-coastal	-	0.99	0.02	0.29	18.58	0.14	1.26	17.24
Sardinia	**294992**	**0.94**	**0.72**	**0.60**	**12.55**	**0.39**	**1.92**	**13.89**
Average for coastal	-	3.17	2.75	1.18	11.78	0.07	1.16	18.61
Average for non-coastal	-	0.69	0.07	0.57	16.17	0.06	0.70	21.57
Veneto	**1642359**	**0.49**	**0.27**	**0.08**	**32.48**	**0.14**	**0.83**	**9.52**
Average for coastal	-	7.42	7.02	0.00	11.19	0.04	0.52	14.42
Average for non-coastal	-	0.59	0.06	0.16	39.48	0.13	0.53	13.14

Nace rev2 sectors: A: Agriculture; 03: Fishing; B: Mining; C: Manufacture; D: Electricity; E:Water supply; F: Construction

Tab. 3 - (continued)

Coastal municipalities	G	H	I	J	K	L	M	P
Campania	**27**	**7.4**	**7.**	**1.49**	**2.22**	**0.96**	**7.49**	**1.12**
Average for coastal	27.3	4.34	18.2	1.17	1.16	0.99	7.13	0.52
Average for non-coastal	26.9	4.51	9.08	0.68	1.04	0.44	7.32	0.78
Emilia Romagna	**19.2**	**4.97**	**8.38**	**2.15**	**3.39**	**2.26**	**6.52**	**0.30**
Average for coastal	22.4	3.54	15.09	1.30	1.66	4.70	5.32	0.21
Average for non-coastal	18.1	4.80	9.16	1.07	0.86	1.70	4.24	0.20
Friuli-Venezia Giulia	**17.3**	**4.18**	**7.19**	**2.07**	**5.41**	**1.74**	**6.72**	**0.35**
Average for coastal	20.5	3.26	15.96	1.72	3.47	3.16	5.70	0.33
Average for non-coastal	17.7	3.09	12.84	0.89	1.12	1.36	4.61	0.41
Liguria	**20.58**	**8.97**	**8.97**	**1.76**	**3.04**	**2.15**	**7.91**	**0.34**
Average for cosata	24.35	3.72	22.35	1.19	1.09	3.57	6.34	0.30
Average for non-coastal	20.68	3.78	15.78	0.54	0.77	1.10	4.41	0.11
Apulia	**26.89**	**5.22**	**0.08**	**0.02**	**1.93**	**0.79**	**7.55**	**0.42**
Average for coastal	28.15	2.92	0.14	0.01	0.97	0.70	6.77	0.31
Average for non-coastal	28.80	3.84	0.08	0.01	1.27	0.47	6.42	0.31
Sardinia	**26.17**	**6.05**	**9.54**	**2.31**	**2.58**	**1.08**	**7.35**	**0.49**
Average for coastal	25.44	3.35	15.55	0.89	0.80	1.31	5.80	0.30
Average for non-coastal	28.43	4.55	11.43	0.52	0.38	0.19	5.59	0.18
Veneto	**21.26**	**4.40**	**7.39**	**2.03**	**3.42**	**2.26**	**6.15**	**0.28**
Average for coastal	25.09	4.37	15.58	0.74	0.63	3.73	4.81	0.25
Average for non-coastal	18.33	3.69	8.76	0.92	1.27	1.91	4.29	0.21

Nace rev2 sectors: G: Wholesale; H: Transport; I: Accommodation; J:Information and communication; K:Financial activities; L:Real estate; M: Professional, scientific and technical activities; P: Education; Q: Health, not included for space constraints. Results are available upon request

In Liguria, the primary sector (agriculture, forestry and fishing) represents an average share of 0,6% of the whole municipal employment in coastal municipalities with respect to about 0,9% in non-coastal municipalities. These values reach relatively high levels in the sector of fishing (0,5%) with respect to agriculture (0,04%), and this is the opposite trend of non-coastal municipalities. In Liguria, constructions represent a significant sector of employment, with average percentages that reach 14,3% in coastal municipalities and 24,5% in non-coastal municipalities. Most of services

have a higher average of the percentage of the employment in coastal municipalities than in non-coastal ones.

In Apulia, the primary sector (agriculture, forestry and fishing) represents an average share of 2,08% of the whole municipal employment in coastal municipalities with respect to about 0,99% in non-coastal municipalities. This percentage is mainly due to the employment in the fishing, which is 1,64% with respect to the 0,32% of agriculture. The manufacturing sector has an average employment of 16,63% in coastal municipalities and an average of 18,57% in non-coastal ones. It has to be noted that in some sectors, especially those in which a certain quantity of freshwater is required (such as the production of beverages or the leather manufacturing), the average employment is higher in coastal municipalities than in non-coastal ones. The building sector instead hires more people in non-coastal municipalities 17,24% with respect to 13,75%). Finally, in the sector of services the averages in the coastal municipalities (28,15%) is almost the same as in non-coastal ones (28,78%).

In Sardinia, the primary sector (agriculture, forestry and fishing) covers an average share of 3.17% of the occupation in coastal municipalities compared to a much lower 0.69% for non-coastal. This difference is due mainly to the level of employment of the fisheries sector, equal to 2.75% compared to 0.35% of the agriculture sector. These values are greater in comparison to the average share for the non-coastal areas. The opposite occurs in the manufacturing sectors, which have an average of 11,78% of employment in coastal municipalities and an average of 16.17% of employment in non-coastal areas. The constructions instead occupy a larger share of individuals in non-coastal areas (21.51% vs. 18.61%). Finally, with regard to services, the average share of employment of the commercial activities of the coastal municipalities (25.44%) is lower than the average of the employment shares of common non-coastal (28.43%), while accommodation services and catering (tourism), information services and communications, financial services, education and real estate activities are on average higher in the coastal municipalities.

Veneto in the primary sector (agriculture, forestry and fishing) covers an average share of 7.42% of total employment in the coastal municipalities compared to a 0.59% in non-coastal areas. In most manufacturing sectors and services, the employment shares exceed those of non-coastal areas, following a pattern similar to that of Emilia-Romagna.

2.2 Relative economic specialization

The economic specialization of the municipalities can be seen in relative terms through local specialization indices given by the ratio between the shares of each sector in each municipality with respect to the share that the same sector has in the regional employment. An index greater than 1 suggests a specialization relative to the region. More in detail, defined *i* the municipality and *j* the sector, the index of local specialization is given by:

$$Spec.loc_{ij} = \frac{A_{ij}}{\Sigma_i A_{ij}} . \frac{\Sigma_i \Sigma_j A_{ij}}{\Sigma_j A_{ij}} ,$$

where A_{ij} is the number of employees in the sector *j* in the municipality *i* and this implies that the following sums are: $\Sigma_i A_{ij}$ is the total number of employees for any sectors, *j*; $\Sigma_j A_{ij}$ is the total number of employees in the municipality, *i* and $\Sigma_i \Sigma_j A_{ij}$ is the total number of employees in the region.

Another indicator that measures the difference in specialization between coastal municipalities and the region consists of the index of dissimilarity. This is given by:

$$Ind.Diss. = \frac{1}{2} . \sum_i \left| \frac{A_{ij}}{\Sigma_i A_{ij}} - \frac{\Sigma_j A_{ij}}{\Sigma_i \Sigma_j A_{ij}} \right|$$

that is half of the sum of the absolute differences between the sum of the shares of sector j in the employment of the municipality *i*, and the sum of the shares of employment of sector *j* to the total regional employment in all sectors. This index varies between zero and one with zero indicating complete correspondence, and 1 full difference between the production structures of municipality *i* and region. The results are provided in Table 4 and graphically are represented in Figure 1

In summary, Campania shows a situation where the coastal municipalities show a dissimilarity index slightly lower, in average (0.55) than that of non-coastal ones (0.60) thus presenting a greater similarity, albeit slight, of production structure (employment) than non-coastal. Figure 1a confirms this slight tendency, although it is not delineable a dominant structure. In conclusion, although the coastal municipalities have a production structure typical and different from the non-coastal ones, (i.e. high shares of certain sectors municipal employment, specialization or de-specialization in given sectors), they influence the entire production structure in a slightly more pronounced way than non-coastal areas.

Tab. 4 - Local specialization index of productive sectors (employment) in coastal municipality compared to non-costal municipality, 2011.

	A	03	B	C	D	E	F	G
Campania								
Average index for coastal municipality	5.50	10.3	0.69	0.60	0.18	0.78	1.23	1.01
Average index for non coastal munic.	2.28	0.09	2.52	1.21	0.35	0.56	1.62	1.00
Emilia-Romagna								
Average index for coastal municipality	13.24	29.1	0.54	0.56	0.12	1.99	1.20	1.16
Average index for non coastal munic.	1.74	0.38	2.06	1.20	0.22	1.22	1.58	0.94
Friuli-Venezia Giulia								
Average index for coastal municipality	13.70	30.3	0.27	0.48	0.10	0.60	1.30	1.18
Average index for non coastal munic.	2.57	0.43	3.05	1.00	1.80	0.42	1.67	1.02
Liguria								
Average index for coastal municipality	2.39	3.27	1.83	0.48	0.26	0.42	1.39	1.18
Average index for non coastal munic.	3.62	0.28	3.06	1.09	0.04	0.16	2.38	1.00
Apulia								
Average index for coastal municipality	2.93	3.79	1.64	0.93	0.42	0.48	1.06	1.05
Average index for non coastal munic.	1.40	0.06	1.29	1.04	0.93	0.75	1.33	1.07
Sardinia								
Average index for coastal municipality	3.37	3.81	1.97	0.94	0.17	0.60	1.34	0.97
Average index for non coastal munic.	0.73	0.10	0.96	1.29	0.16	0.36	1.55	1.09
Veneto								
Average index for coastal municipality	15.13	25.7	0.00	0.34	0.31	0.63	1.52	1.18
Average index for Average index for non coastal munic.	1.24	0.22	2.08	1.23	0.94	0.62	1.38	0.85

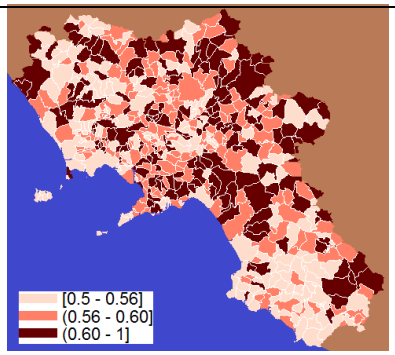
Nace rev2 sectors: A: Agriculture; 03: Fishing; B: Mining; C: Manufacture; D: Electricity; E:Water supply; F: Construction; G: Wholesale

Tab. 4 - (continued).

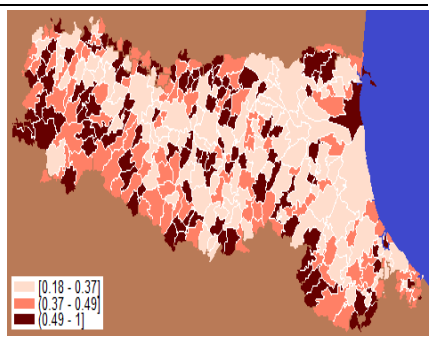
	H	I	J	K	L	M	P	***Dissimilarity Index***
Campania								
Average index for coastal municipality	0.59	2.48	0.79	0.52	1.03	0.95	0.47	0.55
Average index for non coastal munic.	0.61	1.23	0.46	0.47	0.45	0.98	0.70	0.60
Emilia-Romagna								
Average index for coastal municipality	0.71	1.80	0.61	0.49	2.08	0.82	0.69	0.43
Average index for non coastal munic.	0.97	1.09	0.50	0.25	0.75	0.65	0.65	0.44
Friuli-Venezia Giulia								
Average index for coastal municipality	0.78	2.22	0.83	0.64	1.82	0.85	0.92	0.46
Average index for non coastal munic.	0.74	1.79	0.43	0.21	0.78	0.69	1.15	0.55
Liguria								
Average index for coastal municipality	0.41	2.49	0.68	0.36	1.66	0.80	0.89	0.39
Average index for non coastal munic.	0.42	1.76	0.31	0.25	0.51	0.56	0.33	0.54
Apulia								
Average index for coastal municipality	0.56	1.79	0.55	0.50	0.89	0.90	0.75	0.26
Average index for non coastal munic.	0.73	1.07	0.49	0.65	0.59	0.85	0.75	0.28
Sardinia								
Average index for coastal municipality	0.55	1.63	0.38	0.31	1.21	0.79	0.62	0.31
Average index for non coastal munic.	0.75	1.20	0.22	0.15	0.18	0.76	0.37	0.40
Veneto								
Average index for coastal municipality	0.99	2.11	0.36	0.19	1.65	0.78	0.88	0.46
Average index for Average index for non coastal munic.	0.84	1.19	0.46	0.36	0.84	0.70	0.73	0.47

Nace rev2 sectors: H: Transport; I: Accomodation; J:Information and communication; K:Financial activities; L:Real estate; M: Professional, scientific and technical activities; P: Education; Q: Health, not included for space constraints. Results are available upon request.

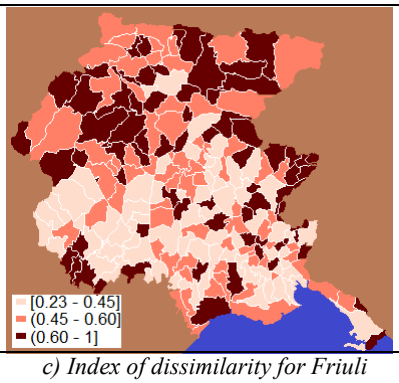
Fig.1 - Index of dissimilarity for the municipalities of regions under study, 2011



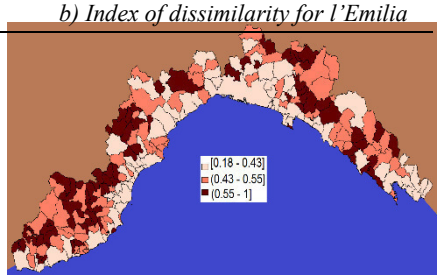
a) Index of dissimilarity for Campa-



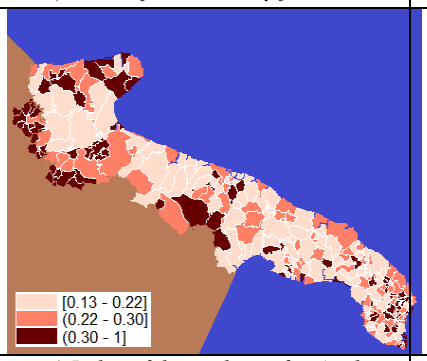
b) Index of dissimilarity for l'Emilia



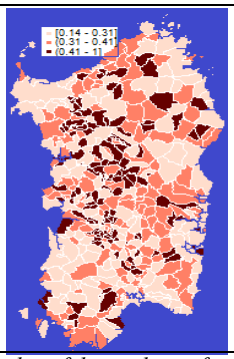
c) Index of dissimilarity for Friuli



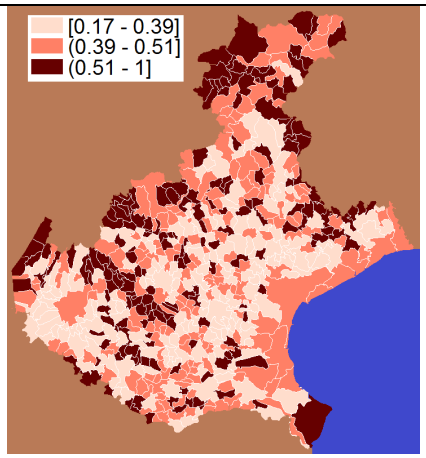
d) Index of dissimilarity for Liguria



e) Index of dissimilarity for Apulia



f) Index of dissimilarity for Sardinia



g) Index of dissimilarity for Veneto

Emilia Romagna shows a varied situation, as shown by the dissimilarity index presented in the last column of Table 4 and in the Figure. 1b. Coastal municipalities present an identical dissimilarity index, with an average value of 0,44 very close to the 0,45 of coastal municipalities, presenting a lack of differentiation in the productive structure (employment) with respect to non-coastal municipalities. It is therefore possible to conclude that, even if costal municipalities have typical productive structures different from those in non-coastal municipalities, they nevertheless influence the entire regional productive structure much more than non-coastal municipalities.

In Friuli Venezia Giulia, both coastal and non-coastal municipalities have on average a positive localized specialization (>1) –with respect to the regional average- in the primary sector (the same as in the previous two regions). It is possible to find differences in the manufacturing of fish and shellfish, sector that represents a high specialization of non-coastal municipalities. This is due to the high level of specialization of some non-coastal municipalities very close to coastal municipalities. In some manufacturing activities, coastal municipalities are de-specialized but there are some subsectors in which coastal municipalities are highly specialized, such as the fruit manufacturing, the textile industry, and oil refining. In some sectors in which coastal municipalities are de-specialized (index <1), they have in average a higher specialization index than non-coastal municipalities.

Liguria, with an average index of 0.39 coastal municipalities, has a stronger similarity of their productive structure (employment) with respect to non-coastal municipalities (index 0.54). Therefore, coastal municipalities have a typical productive structure very different from non-coastal munici-

palities, they have a certain specialization or de-specialization with respect to the regional average in the different productive sectors (e.g., manufacturing vs. services), but nevertheless they influence the whole Ligurian productive structure, much more than non-coastal municipalities. This result reflects also the fact the 86% of the whole employed people belong to companies localized in coastal municipalities.

In Apulia (Figure 1e), coastal municipalities have a positive average (>1) in the local specialization (with respect to the regional average) in the primary sector (2.93), value given by a higher local specialization in almost all the primary sub-sectors (agriculture 1.23; forestry 6.38; fishing 3.79). Non-coastal municipalities, instead, are in average specialized in this sector (1.39), but have an exclusive specialization only in the agriculture (3.09) and forestry (8.39). Coastal municipalities are de-specialized in manufacturing. In some other sectors in which coastal result to be de-specialized (index <1), these have in average a lower specialization index than non-coastal municipalities. It is the case of energy, water and garbage, transports, education, public health.

Sardinia has a pretty varied situation because there is not a clear pattern distinguishing coastal and non-costal municipalities. Some sectors have an absolute specialization in coastal municipalities, but do not have a relative specialization with respect the region, where the same sectors present higher shares of sectorial employment. Other sectors, instead, have a high absolute specialization in non-coastal municipalities, but do not have it in relative terms with respect to the region. Moreover, it is possible to figure out intermediate situations where there is not an absolute specialization either in costal or in non-coastal municipalities. The average dissimilarity index in coastal municipalities is 0.31 and is lower than the average index in non-coastal municipalities (0.40). This shows that coastal municipalities have a higher degree of similarity of the productive structure (employment) with respect to non-coastal municipalities. Finally, Figure 1f shows that the highest degree of dissimilarity is in the inner part of the region. Given this evidence, it is possible to conclude that, even if coastal municipalities have typical productive structures different from those of non-coastal municipalities, they influence the whole regional productive structure. This result reflects also the fact that the 63% of the whole employed people work for companies localized in coastal municipalities.

In Veneto (Fig.1g) the results and the productive structure result to be coherent with those obtained for Emilia Romagna and then it is possible to refer to the conclusions obtained for that region.

2. Results and Discussions

The analysis and the indicators above can be detailed for two groups of sectors that represent a more direct interface between the local economy and marine resources, namely sectors highly dependent on sea (‘marine’ sectors) and ‘non-marine’ sectors with high pressures on the coastal environment, from now on ‘high impact’ sectors (EEA, 2013).

First, as part of the census data for the sectors ATECO 2007, were identified sectors that are closely dependent on the sea because of its ecological conditions (i.e. fishing).

The four groups of selected sectors are shown in Table 5. Compared to the classification ATECO, they have been identified by selecting the entire section (as in the case of the 'activity of accommodation and catering'), or specific Divisions (as in the case of 'fishing and aquaculture' which belongs to Section A, Agriculture, and 'shipping', which belongs to Section H and so on), or individual groups (as in the case of 'canned fish' and 'construction of ships and boats' which belong to Section C, manufacturing).

Tab. 5 - Sectors dependent on marine resources by sections, divisions and groups ATECO 2007.

Sectors depending on the sea	***Section***	***Division***	***Group***
1. Sectors related to fishing		03: fishing and aquaculture	10.2: processing and preserving of fish, crustaceans and mollusks
2. Shipbuilding			30.1: construction of ships and boats
3. Maritime transport		50: maritime transport and inland water	
4. Tourism and related services	I: accommodations services and catering	79: travel agencies, tour operator and other reservation service and related activities	

The sectors of fishing and tourism need some clarifications. In the case of fisheries, as already noted, the census data may represent an underestimation of the actual systematic employment sector, which reduces the weight of the industry compared to other organizations that work with enterprise more structured (Mazzanti and Zoboli, 2009). A more thorough analysis of the figures for fishing will be carried out in future works.

In the case of tourism, it is obvious that the distinction between marine tourism and other accommodation and food activities is not immediate. However, to our level of analysis, that we recall lies in analysis of the em-

ployment in this sector for the coastal municipalities it might be logically expected that the sea is the main attraction for tourist destination and recreation in coastal municipalities. Anyhow, the activities of accommodation and catering in medium and large coastal cities, such as Genoa in Liguria, may cover activities that have nothing to do with the marine tourism but unfortunately, there is not a systematic survey of the motivations of the presences in hotels and acquaintances of shops, which allow a clear picture to the municipal level. More detailed analysis on the number of tourists will be developed in future works. The economic variables (employment, in our case) for these four aggregates of sectors can point that coastal municipalities, and the areas they belong to, are economically dependent on the sea.

These same groups of sectors are the immediate interface between the local economy and the sea and present, always according to the productive techniques they use, significant environmental impact on the marine resources, on the coasts and on the environment in general. For example, in terms of CO2 emissions per each employed person, fishing and maritime transports are among the sectors with the highest indicators (Mazzanti et al., 2012). According to this same indicator, tourism seems to be a "light" sector in terms of expected direct impacts, but several other sectors are linked to tourism, such as touristic service providers or tourists themselves. Moreover, even if the justification of tourism or of the stay is not linked to the sea, for the fact itself that it takes place in maritime municipalities it makes some pressures on the maritime-coastal environment. On the other hand, these same sectors critically depend on the availability and the quality of natural maritime and coastal resources, without which fundamental inputs are missing. These groups of sectors are therefore the midpoint of a "sustainable maritime economy" which may guarantee continuous incomes and employment, both quantitatively and qualitatively significant, using natural and environmental resources.

A second group of sectors is made up of those "high pressure" economic activities, that is to say those activities not directly linked to maritime resources, but localized in coastal zones and that may exert environmental pressures, both directly and indirectly, on the coast and the sea (pollution, industrial risks, permanent territorial changes). These are sectors belonging to heavy industries or intensive manufactures of resources. These sectors have been selected on the basis of: (i) the literature on pressures; and (ii) an indicator on the CO2 emission intensity, atmospheric pollutant and heavy metals per employed derived by NAMEA., (Moll et al. 2007).

Even if this indicator represents a non-exhaustive set of pressures, it can be disaggregated according to the ATECO sectorial economic divisions into a wide range of pressures and can summarize several environmental

characteristics of the productive sectors. For example, the intensity of CO2 per employed summarizes the energy technology of the sector, which is in turn linked to the capital intensity of the sector (plant design). therefore It can indirectly suggest the presence of localized aggregate pollution, the intensive presence of infrastructures (e.g., communications and transports), the presence of industrial incidents. Further details on the pressures of some of these sectors will be presented in future works.

The sectors selected on the basis of the literature and the indicators deriving from NAMEA are shown in Table 6 and are composed either of whole ATECO section or of Divisions selected within Section C, Manufacturing activities. It should be noted that, while the mining, quarrying, manufacturing, energy, water and waste, and those selected are manufacturing-intensive emissions per employee, in the cases of extractive and construction sectors the direct emission, according to NAMEA, are relatively low. However, these two sectors are intensive of the territory, in the sense that involve permanent or semi-permanent alterations, and also produce a high intensity of waste (by weight) thus loading the territory of high overall environmental pressures (see, among others, Mazzanti, Paleari, Zoboli 2007).

Tab. 6 - High environmental pressure sectors by sections and divisions ATECO 2007.

High environmental pressure sectors	***Section***	***Division***
1. Extractive sector	B: mining and quarrying	
2. Coal and oil		19: coke products deriving from oil refining
3. Chemistry		20: chemical products
4. Non-metallic Minerals		23: manufacture of other products from the processing of minerals not metallic mineral
5. Metallurgy		24: metallurgy
6. Metal products		25: metal products (except machinery and equipment)
7. Energy Production	D: supply of electricity, gas, steam and air conditioning	
8. Water and waste	E: water supply sewerage, waste management and remediation	
9. Construction	F: construction	

The joint consideration of specialization of coastal municipality in sectors that are directly related to the sea (in economic-environmental terms) and the specialization of coastal municipality in sectors of high environmental pressure can then provide an overview of: (i) dependence of the economy from the sea; (ii) the pressure of the local economy on the sea, through the impacts of 'marine' and high pressure sectors that are resources

intensive; (iii) potential conflicts between economic sectors that are dependent from the sea and the high environmental pressure sectors that overwork the sea and the coasts.

2.1 Campania

In Campania much of the coastal municipalities has a high share of employment in sectors related to the sea. The average share of employment of coastal municipalities is around 21%, well above the average for non-coastal (about 9%).

It is however important to note that the index of local specialization for sectors depending on the sea is less than 1 in very few occasions (5 coastal municipalities of 60). The index of local specialization of coastal municipalities in average is equal to 2.4 compared with a 1.08 for non-coastal (where there are tourist activities that affect the data).

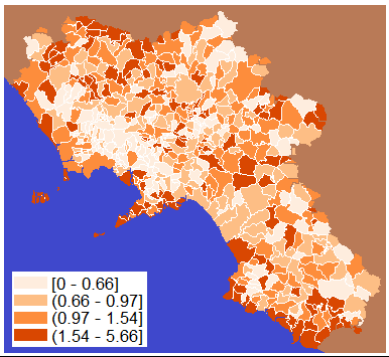
At the same time, the total employment for sectors with 'high environmental pressure' is equal to 16%. The coastal municipalities have an average of shares slightly higher (17.2%), but lower than in non-coastal areas (24.04%). However, that the indices of local specialization of these sectors in the majority of cases is less than 1 and the average value of the indexes of local specialization in coastal municipalities is slightly above this threshold (1.05). This value is lower than the average of the index of specialization of non-coastal municipalities (1.46).

So as a first conclusion in several coastal municipalities, there is the presence of high environmental pressure on the environment however this plays a greater role in non-coastal areas. Table 7 and Figures 2a and 2b show that in many coastal municipalities coexist sectors depending on the sea and intensive sectors that have high impact on the environment.

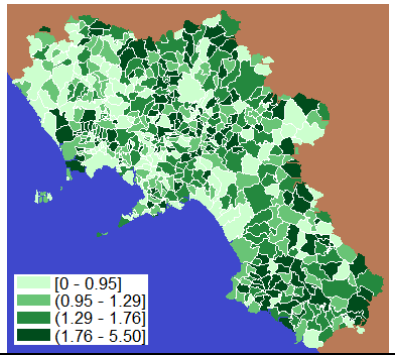
Tab. 7 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality (if negative: relative specialization in sectors with high pressure), Campania, 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea	Index of local specialization for sectors with high pressure	Difference between the two index
Naples	1.09	0.56	0.53
Average index for coastal municipalities	***2.45***	***1.05***	1.4
Average index for non-coastal municipalities	***1.08***	***1.46***	-0.38

Fig. 2. - Local specialization index for "marine" and "high pressure" sectors in the municipalities of Campania, 2011.



a) Local specialization index "marine" sectors



b) Local specialization index "high impact" sec-

2.2 Liguria

In Liguria, most of coastal municipalities has high levels of occupation in sectors linked to the sea, as they are defined here. In some cases, these shares are over the 50% and are in most cases higher than the regional average (12%), and only in few municipalities they are lower than 10%. The average of coastal is around 24%, significantly higher than the average for non-coastal (16%), with a significant variability. It has to be noted, anyhow, that tourism is the leading sector, in the whole region and for both types of municipalities. Tourism has employment shares very close to the total (with a low variability among coastal municipalities).

The result of the relative weight of tourism among the maritime sectors may derive from an underestimation of the effective number of employed in the fishing and other sectors linked to the sea (transports). Moreover, some sectors, such as shipbuilding and maritime transports, are presented with companies and employees only in some municipalities, in particular in larger ones (e.g., the maritime transports in Genoa that use the 4% of the total operators) or in some very specialized municipalities (such as shipbuilding in Ceriale, Ameglia, Lerici). These same sectors present shares that, even if low overall, they are nevertheless multiple with respect to the same sectors in non-coastal municipalities.

It is relevant to note that the local specialization index for the sectors depending on the sea (ratio between the share of the sectors in the municipality and the share of the sectors in the region, Table 8) in less than 1 (lack of specialization) for 11 coastal municipalities over 63. In some cases, these are the main cities and Genoa, that have complex economic structures. In any case, in the other 52 coastal municipalities the index reaches values >1 with peaks of 5. The local specialization index of coastal municipalities is on average 2.1 with respect a value of 1.3 for non-coastal ones (where there are touristic activities influencing the data).

For the sectors identified here as a 'high environmental pressure', Liguria shows a 18.8% of total employment. The coastal municipalities have an average of units lower (17.3%) compared to non-coastal municipalities (about 30%). In addition, the local specialization indices of these sectors in coastal municipalities are very often less than 1 (lack of specialization), with an average of 0.9. Non-coastal municipalities instead, show an average of 1.6 (specialization relative to the region). This would seem to indicate a poor relative importance of these sectors in the economy of the coastal municipalities.

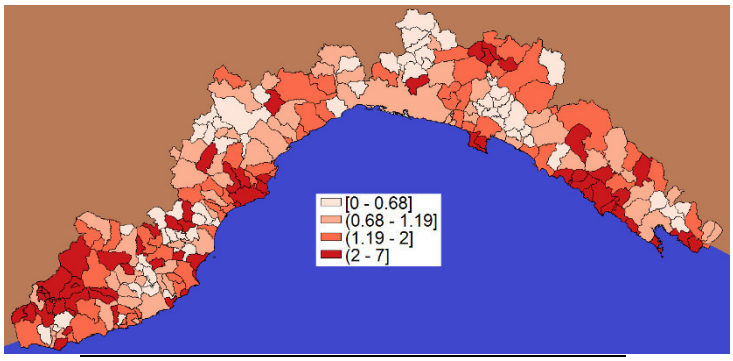
The overall figure for sectors with high pressure is generally dominated by constructions, which represent the bulk of the overall share in all municipalities (coastal or not), with some tips to 30%, and in only 12 coastal municipalities represent less than 10 % of total employment.

Finally, in 24 coastal municipalities the local specialization indices are greater than 1. This figure is certainly influenced by the construction sector, where there is widespread specialization in many coastal municipalities. The strong presence of the constructions may be partly related to the tourist activity, which is strong in the coastal municipalities.

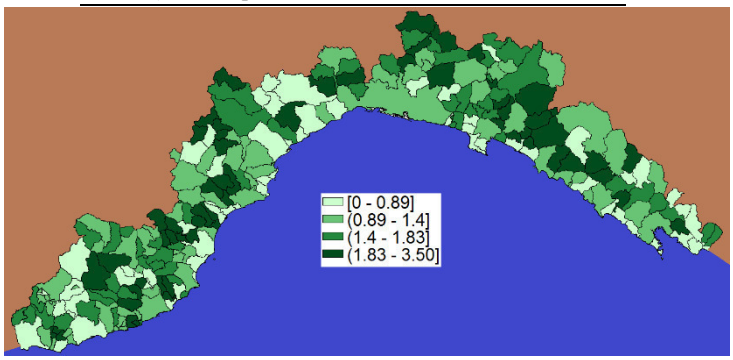
Tab. 8 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality (if negative: relative specialization in sectors with high pressure), Liguria, 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea	Index of local specialization for sectors with high pressure	Difference between the two index
Genoa	0.79	0.95	-0.15
Average index for coastal municipalities	***1.74***	***1.21***	0.53
Average index for non-coastal municipalities	***1.07***	***1.30***	-0.23

Fig. 3 - Local specialization index for "marine" and "high pressure" sectors in the municipalities of Liguria, 2011.



a) Local specialization index "marine" sectors



b) Local specialization index "high impact" sec-

Table 8 and Figures 3a and 3b show that in many coastal municipalities there is a specialization in 'marine' sectors higher than those in 'high pres-

sure' sectors. However, for 14 coastal municipalities the situation is reversed with an index of specialization in the high-pressure sectors that exceeds that in the sectors related to the sea (between these municipalities there are also larger cities as Genoa and La Spezia). Even in the presence of a link between tourism and specialization in construction, a dominant sectors among those at 'high pressure', many coastal municipalities contemporary show an important presence of sectors that depend on the sea and sectors not related to the sea but that have high (potential) impacts on environment (environmental risks) and on the same marine activities.

2.3 Apulia

In Apulia, most of coastal municipalities present high shares of employment in sectors linked to the sea. The average of the shares of coastal is around 16%, a much higher value than the one of non-coastal municipalities (8.55%). Also in this case, these data are largely controlled by tourism, whose employment shares are very close to the total (with a low variability among coastal municipalities).

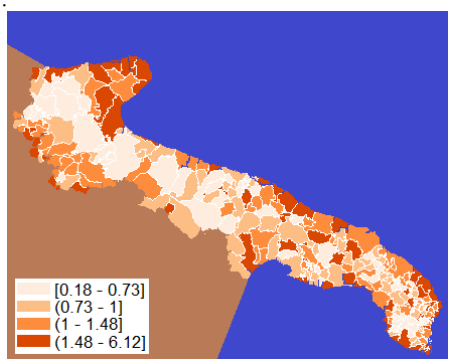
The same considerations adopted for the two regions previously analyzed count here and we can therefore conclude that the economic dependence on the sea of coastal municipalities is controlled by tourism, both directly and, presumably, as sector of demand of fishing products.

Values for the 'high environmental pressure' sectors are very similar to those of the regions previously analyzed. The percentage of total employment in Apulia is equal to 19.23%. The coastal municipalities have an average share of 19.94% that is lower than non-coastal areas (23.91%). It should be noted, however, that the indices of local specialization of these sectors, in the majority of cases, are less than 1 and the average value of the indexes of localization in coastal municipalities is slightly above this threshold (1.04). Even for Apulia a big impact is due to the construction industry and the manufacture of metal products. We can say that in some cases, certain sectors such as construction and the manufacture of metal products, have a high index of specialization also in coastal municipalities. Table 9 and Figures 4a and 4b summarize these results.

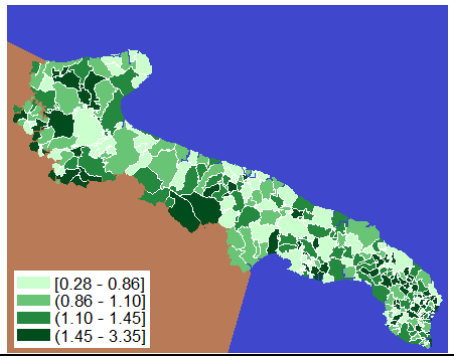
Tab. 9 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality (Apulia, 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea	Index of local specialization for sectors with high pressure	Difference between the two index
Bari	0.89	0.71	0.18
Average index for coastal municipalities	***1.86***	***1.04***	***0.82***
Average index for non-coastal municipalities	***0.99***	***1.24***	***-0.25***

Fig. 4 - Local specialization index for "marine" and "high pressure" sectors in the municipalities of Apulia, 2011.



a) Local specialization index "marine" sectors



b) Local specialization index "high impact" sec-

2.4 Sardinia

In Sardinia, most of coastal municipalities present high shares of employment in the sectors linked to the sea, as we define them here. These shares are often higher than the average regional share (18%) and only in few municipalities it is lower than 10%. The average of the share of the coastal is around 19%, definitely higher than the average for non-coastal ones (11.7%), with a low variability. It is to be noted, still, that, as in the case of Liguria, also these data are largely dominated by tourism, that has employment shares very close to the total (with a low variability among coastal municipalities).

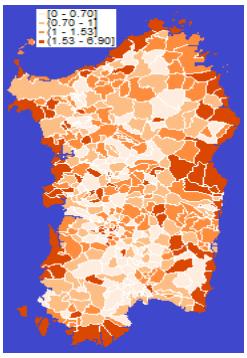
The same considerations adopted for Liguria can be applied to the Sardinian case. Summarizing, these data can derive from an underestimation of the effectively employed in the fishing sector and in other sectors linked to the sea (transports). Moreover, sectors such as shipbuilding and maritime transports are present only in some "hub" municipalities, and especially in those with larger dimensions. It is anyhow relevant to note that Sardinia presents local specialization indices, for the sectors depending on the sea, higher than 1 (presence of specialization) in most of municipalities. For 15 municipalities over 70, instead, the local specialization index results to be lower than 1 (lack of specialization). In some cases, these are main cities and Cagliari which have complex economic structures. In any case, the localized specialization index of coastal municipalities is on average 1.74 with respect to 1.07 for non-coastal ones (where some touristic activities are considered, which influence the data). Also for Sardinia we can conclude that the economic dependence on the sea for coastal municipalities is dominated by tourism, both directly and, presumably, as sector of demand of fishing products, shipbuilding and maritime transports (passengers).

For the sectors identified here as a 'high environmental pressure', Sardinia has a share of 21.24% of total employment. In the coastal municipalities the average share is slightly lower (25.6%) than non-coastal municipalities (27.6%). Furthermore, the indices of local specialization of these sectors, in the majority of cases, prove to be higher than 1 (the presence of relative specialization with respect to the region), with an average value equal to 1.21. This value is lower, albeit slightly, the average of the indices of local specialization of non-coastal areas that have a value equal to 1.3. This would seem to indicate a certain relative importance of these sectors in the economy of the coastal. Table 10 and Figures 5a and 5b show the main results for Sardinia

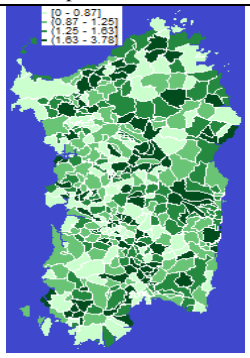
Tab. 10 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality (if negative: relative specialization in sectors with high pressure), Sardinia 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea	Index of local specialization for sectors with high pressure	Difference between the two index
Cagliari	0.86	0.67	0.19
Average index for coastal municipalities	***1.74***	***1.21***	***0.53***
Average index for non-coastal municipalities	***1.07***	***1.30***	***-0.23***

Fig. 5 - Local specialization index for "marine" and "high pressure" sectors in the municipalities of Sardinia, 2011.



a) Local specialization index "marine"



b) Local specialization index "high impact" sec-

2.5 The regions of the North Adriatic sea: Emilia-Romagna, Friuli-Venezia Giulia, Veneto

The regions overlooking the North Adriatic Sea, Emilia-Romagna, Friuli-Venezia Giulia and Veneto have in common some homogeneous characteristics that are hereinafter listed. In these regions, most of coastal municipalities have high shares of employment in sectors linked to the sea and that often result to be higher than the respective regional averages. The averages of the shares of coastal municipalities are in Emilia-Romagna, Friuli-Venezia Giulia and Veneto all very similar among them and respectively 21.4%, 24.8% and 25.5%: these values are largely higher than the respective averages for non-coastal municipalities (between 9% and 13%).

What differs with respect to the comparison with the previous regions is a high variability both at a sectorial level and considering the entirety of the sectors depending on the sea. It has to be noted, indeed, that, differently from previous cases, the regions overlooking the North Adriatic Sea present two highly leading sectors: fishing and tourism. Often, municipalities with a high level of employment in the touristic sector also have a high level of employees in the fishing sector, as already observed before. In this macroregion, by the way, the values linked to the fishing are higher and more variable. Furthermore, there are situations in which the fishing covers almost all the employment levels in coastal municipalities, also without any correlation with the touristic activities. For example, it is useful to see the case of Goro in Emilia-Romagna where the fishing sector occupies the 64.63% vs the 3% employed in tourism. Another example can be Porto Tolle in Veneto, with percentage of 37.4% in fishing and 6% in tourism. Finally, in Friuli-Venezia Giulia, Marano Lagunare occupies shares of 45% in fishing and 12% in touristic activities.

Even in this case, it is possible to apply some generic considerations: this can derive from an underestimation of the effective employees in fishing and other sectors linked to the sea (transports). Moreover, sectors such as shipbuilding and maritime transports are present only in some “hub” municipalities, especially in the larger ones. It is relevant to note that in these regions the local specialization index for those sectors depending on the sea is frequently much higher than 1 (more in detail 2.26 in Emilia-Romagna; 3.06 in Veneto and 2.47 in Friuli-Venezia Giulia) showing a strong localized specialization in sectors linked to the sea. Given this evidence, it is therefore possible to conclude that for the regions overlooking the North Atlantic Sea, Emilia-Romagna, Friuli-Venezia Giulia and Veneto the economic dependence from the sea of coastal municipalities is largely

dominated by tourism and fishing, even more than in previous regions, because of a stronger localized pressure on the few coasts available. Tourism, but especially intensive fishing, are sectors with an ambiguous and complex relationship with the environment, and we will deal with this in a future development of this work.

Also for the sectors here identified as with a "high environmental pressure", the North-Adriatic regions, present homogeneous characteristics hereinafter listed. These activities are present in the economy of the North-Adriatic regions with values included between 17.5% in Emilia-Romagna and 18.6% in Friuli-Venezia Giulia of the total number of employees, coastal municipalities present a lower average of shares (between 14.40% of Emilia-Romagna and 17.8% in Veneto) with respect to non-coastal municipalities (about 25% in all the regions). Moreover, the localized specialization indexes of these sectors are very often lower than 1 (lack of specialization), being in average equal to 0.9 in all the regions versus an average for non-coastal municipalities ranging from 1.30 (Veneto) and 1.42 (Emilia-Romagna). Tabs 11, 12 and 13 and Fig.6 show that the few coastal municipalities have a strong specialization in maritime sectors. Instead, it results to be low the specialization in "high-impact" sectors.

Tab. 11 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality (if negative: relative specialization in sectors with high pressure), Emilia Romagna 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea'	Index of local specialization for sectors with high pressure	Difference between the two index
Rimini	1.75	0.60	1.15
Average index for coastal municipalities	***2.26***	***0.82***	1.44
Average index for non-coastal municipalities	***0.99***	***1.43***	-0.44

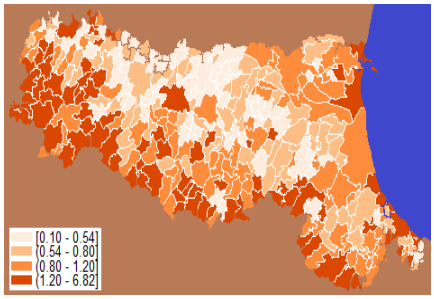
Tab. 12 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality, Friuli-Venezia Giulia, 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea	Index of local specialization for sectors with high pressure	Difference between the two index
Trieste	2.04	0.53	1.50
Average index for coastal municipalities	***2.47***	***0.88***	1.59
Average index for non-coastal municipalities	***1.29***	***1.39***	-0.10

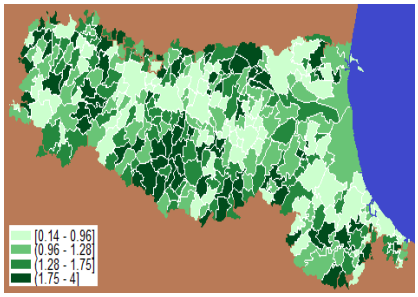
Tab. 13 - Comparison between specialization index of sectors related to the sea and sectors with high impact for coastal municipality, Veneto, 2011.

Coastal Municipality	Index of local specialization for sectors depending on sea	Index of local specialization for sectors with high pressure	Difference between the two index
Venice	2.19	0.65	1.55
Average index for coastal municipalities	***3.06***	***0.97***	2.09
Average index for non-coastal municipalities	***1.11***	***1.30***	-0.19

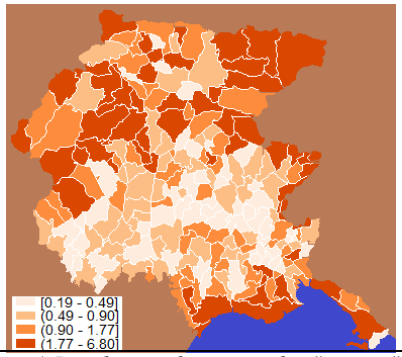
Fig. 6 - Local specialization index for "marine" and "high pressure" sectors in the municipalities of regions overlooking North Adriatic sea, 2011.



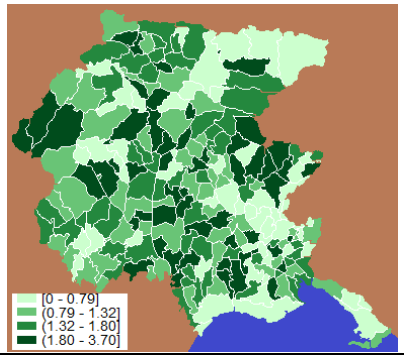
a) Local specialization index "marine"



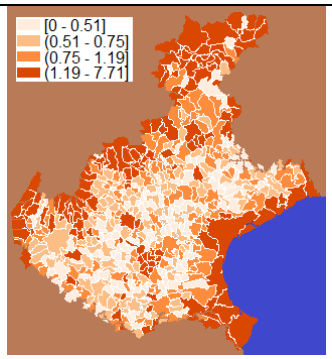
b) Local specialization index "high



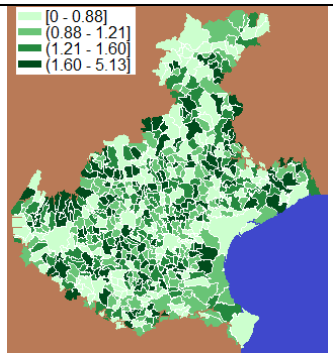
c) Local specialization index "marine"



d) Local specialization index "high



e) Local specialization index "marine"



f) Local specialization index "high

Conclusion

We show that coastal municipalities seem to attract more importance than non-coastal, however the huge impact on the marine resources in the coastal municipalities might be considered in a double way. First, 'marine' sectors play a key role in the wealth and in the economy of the country. Second, 'high impact' sectors put a high pressure on the coastal environment that might influence the 'marine' sectors both in term of use of marine resources that lower touristic potential. Our study shows that in some regions the two groups of sectors coexist and then particular attention have to be devoted in regulating the exploitation and use of marine resources in order to have a positive economic balance between all sectors.

Acknowledgments

The research described in this paper was supported by the Project "Bandiera (Flagship) RITMARE - La Ricerca Italiana per il Mare (The Italian Research for the Sea)" coordinated by the National Research Council of Italy and funded by the Italian Ministry for Education, University and Research, under the National Research Program 2011-2013.

References

Arto I., Genty A., Rueda-Cantuche J.M., Villanueva A., Andreoni V., 2012, Global Resources Use and Pollution, Volume 1: Production, Consumption and Trade (1995-2008); Volume 2: Country Factsheets, JRC Seville.

Barzotto, M., Corò, G., & Volpe, M. (2014). Apertura internazionale e risorse economiche locali. Un'indagine sul radicamento territoriale di imprese multinazionali. Argomenti.

Bowen R.E., Riley C., 2003, Socio–economic Indicators and integrated coastal management, Ocean & Coastal Management, 46: 299–312

Cantasano, N., Pellicone, G., 2014. Marine and river environments: A pattern of Integrated Coastal Zone Management (ICZM) in Calabria (Southern Italy). Ocean & Coastal Management, 89: 71–78

EEA, 2013, Environmental pressures from European consumption and production. A study in integrated environmental and economic analysis, Technical Report 2/2013, European Environment Agency, Copenhagen.

Fadda, S. (2016). Labour coefficients reduction and working time reduction. Argomenti, (4), 67–87

Guarascio, D., Fana, M., Cirillo, V. (2017). La crisi e le riforme del mercato del lavoro in Italia: un'analisi regionale del Jobs Act. Argomenti, (5), 29–56.

Lucchese, M., Nascia, L., Pianta, M. (2016). Una politica industriale e tecnologica per l'Italia. Argomenti, (4), 25–50.

Marin, G., Mazzanti, M. (2013). The evolution of environmental and labor productivity dynamics. Journal of evolutionary economics, 23(2): 357–399

Marin, G., Modica, M. (2017). Socio-economic exposure to natural disasters. Environmental Impact Assessment Review, 64, 57–66.

Marra, C., Turcio, S. (2016). Insider e outsider nel mercato del lavoro italiano. Argomenti, (4), 89–134.

Mazzanti M., Zoboli R. (2009). Environmental efficiency and labour productivity: Trade-off or joint dynamics? A theoretical investigation and empirical evidence from Italy using NAMEA. Ecological Economics, 68: 1182–1194.

Mazzanti M., Montini A., Marin G., 2012, Aggregation biases in environmental extended input output: evidence from Italy and Spain, Ecological Economics, 74: 71–84.

Mazzanti M., Paleari S., Zoboli R., 2007, Effectiveness of environmental taxes and charges for managing sand, gravel and rock extraction in selected EU countries: Italy, ETC/RWM working paper 2007/4 European Topic Centre on Resource and Waste Management, Copenhagen

Meroni, F., Pessina, V., Squarcina, T., Locati, M., Modica, M., Zoboli, R. (2016, June). The economic assessment of seismic damage: an example for the 2012 event in Northern Italy. In International Conference on Urban Risk.

Modica, M., Reggiani, A. (2014, November). An alternative interpretation of regional resilience: evidence from Italy. In ERSA conference papers (No. ersa14p369). European Regional Science Association

Modica, M., Reggiani, A. (2015). Spatial economic resilience: overview and perspectives. Networks and Spatial Economics, 15(2), 211–233

Modica, M., Zoboli, R. (2016). Vulnerability, resilience, hazard, risk, damage, and loss: a socio-ecological framework for natural disaster analysis. Web Ecology, 16(1), 59–62.

Modica, M., Zoboli, R., Meroni, F., Pessina, V., Squarcina, T., Locati, M. (2016). Housing Market Response to 2012 Northern Italy Earthquake: The role of house quality and changing risk perception. Seeds-Sustainability WP Series, (4)

Moll S., Vrgoc M., Watson D., Femia A., Pedersen O., Villanueva A., 2007, Environmental Input-Output Analyses based on NAMEA data. A comparative European study on environmental pressures arising from consumption and production patterns, ETC/RWM working paper 2007/2, European Topic Centre on Resource and Waste Management, Copenhagen.

Niavis, S., Papatheochari, T., Kyratsoulis, T., Coccossis, H. (2017). Revealing the potential of maritime transport for 'Blue Economy'in the Adriatic-Ionian Region.Case Studies on Transport Policy, 5(2): 380–388.

Olsen, S.B., 2003, Frameworks and indicators for assessing progress in integrated coastal management initiatives. Ocean & Coastal Management, 46: 347–361

Sterlacchini, S., Zazzeri, M., Genovese, E., Modica, M., Zoboli, R. (2016, April). Flood damage in Italy: towards an assessment model of reconstruction costs. In EGU General Assembly Conference Abstracts (Vol. 18, p. 13135).

Turner, R.K., 2000, Integrating natural and socio-economic science in coastal management. Journal of marine Systems, 25(3-4): 447–460.

The concentration of Health research and innovation across EU regions♦

di Claudio Cozza* e Monica Plechero°

Abstract

Health research and innovation (R&I) is attracting the attention of EU, national and regional policymakers. As Health policies are becoming a public policy priority – targeting not only social needs but also the overall economic development of EU countries – Health R&I have been identified as key areas of investment. However, despite the attempts to reduce inequalities also in this field, a strong concentration of Health R&I across EU regions still exists. The paper provides recent and novel empirical evidence on the topic, describing the concentration of Health patents, publications and EU project participation in top EU regions. Regional data help in assessing that, also in the Health sector, concentration is not only a cross-country but also a within-country issue.

Keywords: EU regions, Research, Health.
JEL classification: O33, R12.

La concentrazione delle attività di innovazione e ricerca sanitaria nelle regioni UE

Sommario

La ricerca e innovazione (R&I) nel settore della salute sta attraendo sempre più l'attenzione dei policymaker nazionali, regionali ed europei, divenendo un'area strategica di investimento. Le politiche sulla salute sono infatti una priorità pubblica che ha come target non solo i bisogni sociali ma anche lo sviluppo economico nei paesi UE. Sebbene ci siano vari tentativi di ridurre le disuguaglianze all'interno della comunità europea, in questo settore esiste ancora una forte concentrazione in alcune aree rispetto ad altre. L'articolo fornisce nuove e recenti evidenze empiriche sull'argomento mostrando come la diversa distribuzione di attività brevettuali, pubblicazioni e partecipazione a progetti di ricerca non è solo divergente fra paesi ma anche fra regioni appartenenti ai singoli paesi UE.

Parole chiave: regioni UE, Ricerca, Salute.
Classificazione JEL: O33, R12.

♦ This work was supported by European Commission [Grant Agreement No 643574] under the European Union Horizon 2020.
∗ Istituto Ricerche, AREA Science Park, Trieste (IT), claudio.cozza@areasciencepark.it.
° DISEI, Università degli Studi di Firenze, Firenze (IT), monica.plechero@unifi.it.

Introduction

Over the last years, European policymakers – both at the national and at the sub-national level – have widened their perspective regarding Health. From the generic attention to EU citizens' healthcare, the focus has shifted towards a more complex framework where Health is an increasingly crucial social need. Already in 2007 with the white paper "Together for Health" (EC, 2007), the European Commission has identified the most crucial challenges regarding Health in its area: the increase in chronic diseases, the growing technological costs to face Health challenges and especially an ageing population. The consideration of those issues has then been included in the wider Europe 2020 Strategy (EC, 2013a), where two additional policy points have been highlighted:

- Despite a generic increase in health conditions across EU countries, also an increase in inequality can be detected: *«poorer and disadvantaged people die younger and suffer more often from disability and disease»*.
- As a consequence, the concept of "investing in Health" has to be further developed.

Indeed, such a shift in the analytical viewpoint, where Health policies should represent even more than in the past, a pivotal asset for the growth and cohesion of world society, can be found in other policy documents. As stated by the OECD (2014, p.9), *«European countries have achieved significant gains in population health, but there remain large inequalities in health status both across and within countries»*. The efforts made by EU governments are reflected in several recent indicators: Health represents the second most important budget line in EU countries; overall the 73% of Health expenditures is funded by the public sector; and one employee out of 10 works in this sector. Therefore, especially in a EU society where life expectancy constantly grows, investing in Health has to be considered a compulsory task for achieving economic prosperity and social cohesion.

Following this logic, Health is no more intended as a simple value in itself and it is becoming a public policy priority in the EU. For this reason, it is more and more important to focus on the economic aspects of Health. Investing in the efficiency of Health system and especially on prevention will bring also increases in work productivity and will reduce social inequalities. This is especially true when looking at poorer areas and performing an economic analysis at the sub-national level (Purohit, 2016). Furthermore, local public policies are to provide adequate Health services (Williams,

2017), which imply investments in Health Research and Innovation (R&I). Such goals are strictly related to the capability of R&I actors to make substantial advancements in the field (Intereconomics Forum, 2015). Not by chance, Health (together with Demographic change and Well-being) is one of the societal challenges of the EU Horizon 2020 research programme. Health goals are, therefore, intrinsically contained in the EU R&I strategy.

Given the cumulative nature of R&I assets, however, EU countries and especially EU regions are expected to perform very differently. Even more than in general terms, the convergence of EU countries and regions in R&I has to be achieved with strong policy tools (Goecke & Hüther, 2016). Not by chance, then, the EU Horizon 2020 Programme addresses the inequalities in the field of Health R&I, in order to find the right policy measures to reduce the gap among EU countries and regions. Such a gap might be particularly significant in the Health R&I domain, thus implying a minor capacity of some national and/or regional Health systems to respond adequately to societal contextual needs. Following the approach mentioned above, less R&I in Health systems might lead to the worsening of the work and social conditions of some EU areas.

The key role of Health is also confirmed by the fact that it is one of the most recurrent priorities for EU regions' smart specialization strategies (S3, see Sörvik & Kleibrink, 2015). Indeed regions in almost all EU countries claim Health as their S3 priority. However, different regions might refer to specific – and very different – sub-areas of Health, targeting it from very different perspectives. That is, for instance, referring to Health when dealing with the Pharmaceuticals, Biotech or Medical technology sectors, eventually key in their territory; or simply when dealing with their ageing population; or maybe meaning the introduction in their systems of healthcare innovations, such as e-Health.

To tackle such a challenging perspective, a deeper knowledge about the availability and quality of Health indicators across is needed. While the World Health Organisation (WHO) European regional office has developed an extensive exercise for developing adequate healthcare indicators (WHO, 2012), measures of Health R&I in Europe are very scarce. We claim that such limited evidence is in contradiction with the idea of smarter investments in Health and might eventually bring to incorrect policy decisions in EU countries and regions. In particular, a poor knowledge about Health R&I performances and the use of inadequate indicators in Europe might

hide the real inequalities in the sector, thus extending instead of reducing the gap between top and least performing countries.

This paper aims at better understanding Health R&I inequalities, including their technological and economic dimensions, in Europe. It is structured as follows: in section 2 we report the main data limitations and the methodological problems in mapping Health R&I in the EU; in section 3, using novel data, we provide an overview of the current situation in EU Health R&I, showing the concentration and polarisation across countries and regions; in section 4 we provide some conclusions and policy remarks.

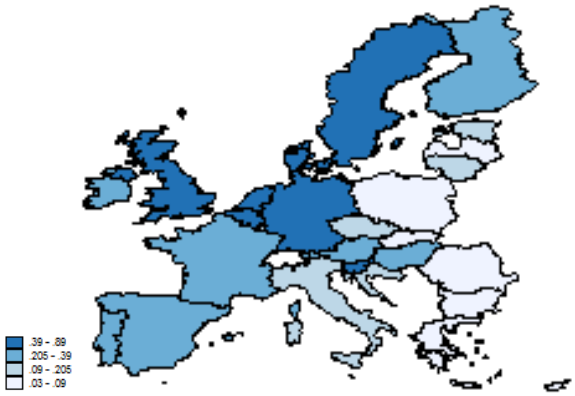
1. The (limited) mapping of Health R&I in the EU

The difficulty in measuring Health R&I is intrinsically related to its definition. Considering the most relevant measure – that is Health R&D – a warning comes from an OECD report related to R&D in Health (OECD, 2001). It is there stated that *«in the widest sense we are interested in all R&D which is relevant to human health. Here there are no generally accepted international definitions or guidelines on coverage. There are few (if any) areas of investigations which can "logically" be excluded from possible relevance to health – perhaps cosmology»*. To overcome such a problem, the WHO in 2013 organised an "Informal workshop on monitoring financial flows in support of health research & development". This workshop has reinforced, in particular, the idea of overcoming the limitations of data availability for Health R&D. Following the WHO workshop, the newly-born Global Observatory for Health R&D by OECD and WHO has already started to work on better indicators for measuring Health R&D[1]. First results of the Observatory have led to estimations of Health R&D and clinical trials provided for all world countries in a recent Lancet

[1] The idea behind this Global Observatory is to monitor and analyze relevant information on Health R&D, building on national and regional observatories (or equivalent functions) and existing global data collection mechanisms with a view to contributing to the identification of gaps and opportunities for health R&D.

publication (Røttingen et al., 2013). Such estimations confirm the high degree of concentration in the EU. As shown in figure 1, the highest shares of expenditure in Health R&D on GDP are detected for most technologically advanced EU countries, including Sweden, Denmark, UK and central EU countries such as Germany, Netherlands and Belgium. With the notable exception of Slovenia and partially Hungary, the least performing countries belong to Eastern Europe. However, according to the Observatory itself, a lot of work still remains to be done in order to provide stakeholders with the best information to monitor and assess Health R&I in all countries and regions.

Fig. 1 – Health R&D (as a percentage of GDP) in EU countries



Source: Own elaboration on Røttingen et al. (2013). Year: 2010 or latest available year.

For mapping Health R&I, there are also other methodological problems. On the one side, this is related to the complexity and specificity of the sector: Health includes manufacturing (e.g. the pharmaceuticals) and services (e.g. the hospitals) activities; it includes very strong investment both by the public and by the private bodies; it relies on strong propriety protection for some technological aspects, while it implies the full accessibility of knowledge for others; it affects both the macro level (the society as a whole) and the micro level (companies, professionals, individual citizens). On the other side, then, there is a more practical problem related to the institutional level at which the policies decisions are taken: while Health policies often involve decisions at the NUTS2 regional level (e.g. using EU

Structural Funds, see EC, 2015), many indicators which should sustain the decision processes only exist at the country level.

In fact, the joint analysis of R&I figures at the NUTS2 regional and sectorial (Health) level is not straightforward. Usually the deepening of one dimension (i.e. the regional one) excludes that of the other one (the sectorial). Indeed the most important publication on the innovativeness of EU regions (that is the Regional Innovation Scoreboard) does not fully cover any specific sector. Regional/sectorial analyses are usually included in case studies or in reports covering one country only or other limited breakdowns (EC, 2013b). Providing ad adequate map of Health R&I in all NUTS2 regions has been therefore one of the main point of a Horizon 2020 project, aimed at filling in the informative gap in terms of Health at the regional level, in the EU[2].

2. An overview of the concentration and disparities of Health R&I in Europe

The mapping of Health R&I has been undertaken selecting the most common indicators in the economics of innovation (Smith, 2005): scientific publications and patent applications. Although it is arguable that both indicators concern more research than innovation, also in the Health sector, it is clear that they catch two different aspects of the R&I process. It is in fact expected that publications reflect more the public sector involvement, while patents are closer to the private engagement in R&I (Callon, 1994). Although this distinction has not to be intended as normative, regional data on Health patents and publications give a confirmation of it. In table 1 we show the correlation coefficients between regional Health outcomes (pa-

[2] The project "European regions network for Health Research & Innovation", funded by the Horizon 2020, having as main goal to propose new initiatives and concrete approaches to EU, national and regional decision-makers in Health to: i) reduce the gaps in Health R&I across the EU regions, ii) to increase the participation in Horizon 2020, and iii) to facilitate synergies between Horizon 2020 (H2020) and European Structural & Investment Funds (ESIFs).

tents and publications) and the breakdown of the main innovation input variable, that is R&D expenditure. The breakdown allows to identify the share of R&D performed in each region by the three main sectors: business, government and higher education (BERD, GOVERD and HERD respectively). In table 1 it is clearly shown as the business sector has a higher correlation coefficient with patents, while the government sector with publications. Intermediate values come out for the higher education sector, and this reflects the specificity of universities for which both outcomes are relevant.

Tab. 1 – Correlation between R&D inputs and outputs

R&D expenditure	Health Patents (2008-2010)	Health Publications (2008-2012)
BERD R&D	0.7906*	0.6039*
GOVERD R&D	0.6829*	0.7089*
HERD	0.7488*	0.9074*

BERD (business expenditure in R&D), GOVERD (government expenditure in R&D) and HERD (higher educational R&D expenditure) refers to year 2011 because of better data quality with respect to previous years. Correlations are significant at 1% level.

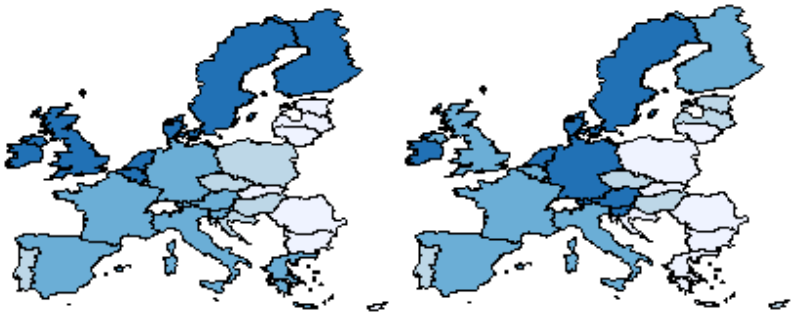
In figures 2 and 3 we show the results of the mapping. The maps show a clear concentration of Health R&I in a limited number of countries and regions. Northern EU countries always show the highest performances, although the two maps do not perfectly coincide. Only four countries (Denmark, Ireland, the Netherlands and Sweden) rank at the top in both indicators, suggesting that specialisation in the sector might be more relevant than the size of the national economies. In fact, several large EU countries only rank in the second quartile, in either one indicator or both. As expected, the almost totality of least performing countries are Eastern EU ones, confirming their urgent need to fill in the gap with the rest of Europe. Not by chance, policy instruments[3] at the EU level have

[3] The definition of Widening countries, which are currently devoted special attention and resources (e.g. a dedicated budget of the Horizon 2020 programme), can be found in EC, 2015, or at: https://ec.europa.eu/programmes/horizon2020/en/h2020-section/spreading-excellence-and-widening-participation)

been recently adopted to tackle the issue and try to help catching-up countries in R&I.

Fig. 2 – Health publications and patents in EU-28 countries, by population

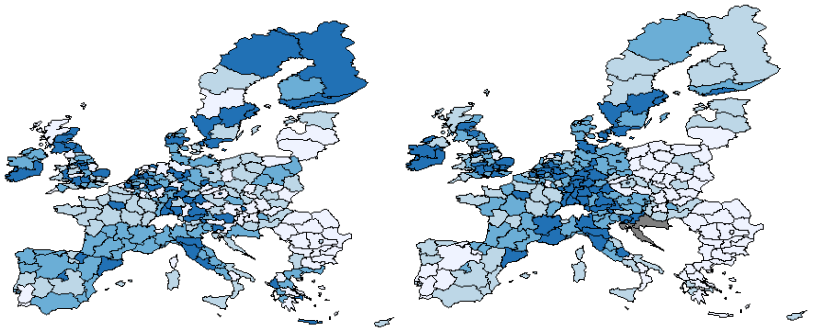
Scientific publications *EPO patent applications*



Source: Own elaboration on European Commission – DG Research data. Patents and publications have been classified by FP7 Health thematic priority. Year: average 2008-2012 for publication, average 2008-2010 for patents. Colours reflect the quartiles.

Fig. 3 – Health publications and patents in EU-28 regions, by population

Scientific publications *EPO patent applications*

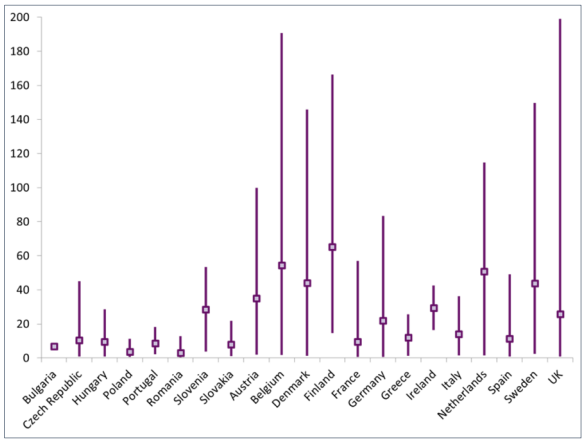


Source: Own elaboration on European Commission – DG Research data. Patents and publications have been classified by FP7 Health thematic priority. Year: average 2008-2012 for publication, average 2008-2010 for patents. Colours reflect the quartiles. Grey colour refers to missing data.

However, what emerges by looking at regional maps is that concentration is not only a cross-countries matter. Indeed, in almost all countries there is a high polarisation of regions in terms of Health R&I outcomes. If we look at regional publications, we can observe that almost all countries have at least one top region, either belonging to the first quartile (mostly in the case of Western EU countries) or to the second one (especially for Eastern EU ones). It is instead in the case of patent applications that the cross-country and within-country polarisations tend to coincide: top regions are almost all located in Central Europe (including Germany, BENELUX but also parts of France and Northern Italy) and in Northern countries (Ireland, UK and Scandinavian ones). In other words, the regional patent map strongly reflects the industrialisation of EU countries and its already known concentration. While, concerning scientific publications, a more "democratic" spread of the indicator might suggest a positive role of public and higher education sectors engagement in Health R&I.

The cross- and within-countries polarisation is then appearing also in the main indicators of the funding of Health R&I. Figure 4 shows the distribution of FP7 Health project participants (in the whole 2007-2013 period). Again, Western EU countries show both the highest average values but also a great disparity between their top and least performing regions. In the group of Widening countries mentioned above, only Slovenia and Czech Republic show performances in line with some of the non-Widening ones.

Fig. 4 – Regional dispersion of FP7 Health projects participation, per million population: average, minimum and maximum values.



Source: EC, CORDA.

Such a figure helps in better understanding the real extent of concentration in European Health R&I. In fact, couples of countries with a very similar average can have a completely different situation behind. We make some examples. A good performing country as the Netherlands has a higher average than Denmark; however, the top Danish region achieves a maximum score of more than 140 projects per million population, while the top Dutch one does not go beyond 120. Even more, the top region in Europe (London) belongs to a country (UK) whose average is not particularly high. Then, a low performing country in terms of average, that is the Czech Republic, shows a top region that is in line with countries with higher averages (e.g. Slovenia and Ireland) and even above large countries (e.g. Italy).

Of course, having a low average might signal the strong unbalances that exist in some EU countries. Indeed, many countries have just one or two spots of better performance, as compared to a very poor environment in the rest of their territories. The joint analysis of the national and the NUTS2 regional level, then, is even more needed to depict the concentration and unbalances of Health R&I, in both top and least performing countries.

The figures shown confirm the idea that less performing regions and countries might need to catch-up and reinforce their R&I performance. As already mentioned, in the Horizon 2020 there is a small share of the overall budget dedicated to Widening countries, including all Eastern countries plus Luxembourg and Portugal. The definition of Widening country follows the EC approach of measuring in a synthetic way the outcomes of the R&I process, as well as its excellence. Indeed the definition derives from the composite indicator of Research Excellence, put forward in a EC-JRC report (2013) which aims at measuring research excellence in Europe, at country level, from a multiple point of view. The (top) quality of scientific and technological outputs concerns four different typologies of research activities: highly-cited publications; high-quality patent applications; quality of universities and research institutes; and capacity to receive prestigious grants such as the ERC ones.

This indicator has not only an intrinsic motivation that is to quantify altogether the different dimensions of research excellence. From a policy perspective, the indicator provides a synthetic overview of R&I to better understand which European countries are less performing and therefore in need of specific policy support. Not by chance, Widening countries are those below the 70% of the EU average.

In the framework of the RegHealth-RI project, an attempt has been made to replicate the EC-JRC indicator for the Health sector, with minor adaptations. Unfortunately, the regionalisation of this indicator – that we consider very important for policy support reasons – is not measurable for strong lack of data[4]. At the national level, the Health Research Excellence indicator has been calculated as shown in figure 5, where it is also compared to the original EC-JRC one.

Fig. 5 – Comparison of variables included in the composite indicators

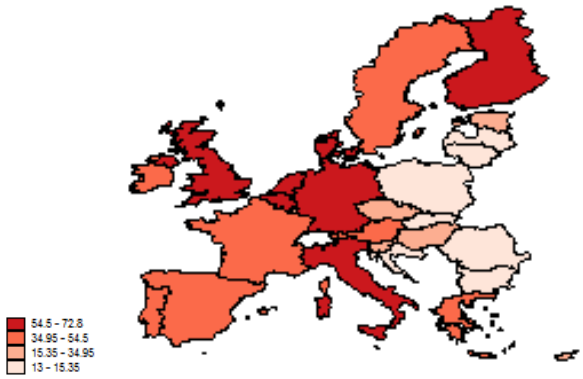
Composite indicator research excellence (EC-JRC, 2013)			
(1) Top 10% most cited publications (2000-2007)	(2) Top Universities & PROs per GERD (2003-2007, 2004-2008)	(3) PCT Patents per population (2000-2008)	(4) ERC Grants per public R&D (2007-2011)
RegHealth-RI composite indicator research excellence			
(1) Health Top 10% most cited publications (2008-2009)	(2) Health TOP universities and PROs (2007-2012)	(3) Health PCT patents per population (2008-2010)	(4) Health ERC Grants per public R&D (GERD+HERD) (updated years)

The intensity of the Health Research Excellence indicator is displayed, for all EU countries, in figure 6, where again the four colours represent the quartiles of the distribution.

Although the composite indicator of Health research excellence at country level appears similar to the EC-JRC one, important differences emerge. For some top performing countries, the Health indicator inverts the overall ranking: Italy goes up from the second to the first quartile, while for Sweden the opposite happens. Overall, the predominance of Nordic and Central-Western EU countries is confirmed. The last quartile includes only Eastern European countries.

[4] To make an example, the lack of information of most cited publications in Health available for all regions. Moreover, given the problematic issues identified also at the national level for some variables, the risk of calculating a regional indicator was to increase even more its unreliability.

Fig. 6 – RegHealth-RI project Composite Indicator of Health Research Excellence



Source: Own elaboration on RegHealth-RI data

All in all, we can observe that such a picture almost overlaps with those of figure 2. This is not surprising, as it merges similar information that we have presented there and similar to those in figure 4. In other words, we believe that such a composite indicator might hide two levels of differences:

- The specific performance of single countries in one indicator (e.g. publications or patents or EU project participation);
- The within-countries regional polarisation, as we have shown in figures 3 and 4.

In practical terms, it is suggested that for those widening regions with low levels of scientific outcomes (health publications) public policies should be aimed at developing local competences. A direct objective might be that of increasing the share of highly educated workers on total population. Vice versa, those widening regions with good scientific performance but that show low performances in terms of health patents , it is suggested to introduce more policies aimed at the networking with partners from advanced regions with stronger innovation capabilities, possibly via public-private partnerships.

Therefore, from a policy perspective we suggest that a deeper and detailed analyses of R&I variables can be more useful than a synthetic picture of the overall phenomenon. Detailed analyses can better inform national and regional policymakers about their specific (e.g. regional & sectorial) strengths and weaknesses, to adopt the most suitable policies. One of the aims of the Horizon 2020 project from which this paper originated was to provide a sectoral and regional breakdown of health R&I variables. The

first descriptive outcomes have been presented in this paper. At the moment, data do not allow further analyses, as most of variables are still available at the regional or at the sectoral level alternatively. To proceed with detailed analyses suggested here, it is recommended that additional evidence, especially on the input side of health R&I, is gathered. The preliminary outcomes of this paper suggest that this analytical direction can be fruitful, as it allows to better target innovation policies. Not only distinguishing between top and least performing regions, but also differentiating different types of regions within these two categories.

Conclusions

In this paper, we have shown the degree of concentration of Health R&I in EU countries and regions. Being R&I more and more key in shaping EU Health policies, shifting from the pure measure of healthcare to a wider concept of "investing in Health", we believe this mapping is of great value. This is particularly relevant for less performing countries (so called Widening) that have and deserve dedicated funding and resources. In fact, their R&I performances are still very far from that of most advanced EU countries.

However, we also suggest that such a Widening definition based on composite indicators (EC-JRC, 2013) might be misleading and a wider analytical approach should be followed. Being Health, on the one side, and R&I, on the other side, increasingly key issues for EU policy.

In addition, given the growing relevance of policies at the regional level, also in the framework of Smart Specialisation Strategies, there is the need of improving measures of regional & sectorial Health R&I. In fact, these sub-national measures might catch specific Health activities and subsectors which singularly or jointly may contribute to the development of some regions, better than standard classifications (e.g. NACE codes). Regional data remain also crucial to identify whether the polarisation of R&I outcomes happens even within countries, also the most developed ones.

References

Callon, M. (1994). Is science a public good? *Science, Technology & Human Values*, 19(4), 395 – 424. Doi: 10.1177/016224399401900401

European Commission (2007). White Paper 'Together for Health: A Strategic Approach for the EU 2008-2013.
European Commission (2013a). Investing in Health. Commission Staff Working Document.
European Commission (2013b). Cross-Cutting Analysis of Scientific Publications versus Other Science, Technology and Innovation Indicators.
European Commission - Joint Research Centre (2013). An analysis of national research systems (I): a composite indicator measuring scientific and technological research excellence, JRC Scientific and Policy Reports.
European Commission (2015). Spreading Excellence and Widening Participation, Work Programme 2016-2017.
Goecke, H. & Hüther, M. (2016). Regional Convergence in Europe, *Intereconomics*, 51(3), 165–171. Doi:10.1007/s10272-016-0595-x
Intereconomics Forum (2015). The impact of Horizon 2020 on Innovation in Europe. Intereconomics, Vol. 50, No. 1.
OECD (2001). Measuring Expenditure on Health-related R&D.
OECD (2014). Health at a Glance: Europe 2014.
Purohit, B. C. (2016). Health care system efficiency: a sub-state level analysis for Orissa (India). *Review of Urban & Regional Development Studies*, 28(1), 55-74. Doi: 10.1111/rurd.12044.
Røttingen, J. A., Regmi, S., Eide, M., Young, A. J., Viergever, R. F., Årdal, C., Terry, R. F. (2013). Mapping of available health research and development data: what's there, what's missing, and what role is there for a global observatory?. The Lancet, 382(9900), 1286-1307. Doi: 10.1016/S0140-6736(13)61046-6.
Smith, K. (2005). Measuring Innovation. In J. Fagerberg, D. C. Mowery, R. R. Nelson (Eds.), *The Oxford Handbook of Innovation*, Oxford, Oxford University Press.
Sörvik, J. & Kleibrink A. (2015). Mapping innovation Priorities and Specialisation Patterns in Europe, S3 Working Paper Series, JRC Technical Reports – IPTS, No. 8, 2015.
WHO (2012). The evidence base of Health 2020.
Williams, G. (2017). Enhancing the value of health care services at regional level. Review of Urban & Regional Development Studies, 29(1), 46–62. doi:10.1111/rurd.12058.