

Dr Anne ter Wal

**ASSOCIATE PROFESSOR OF TECHNOLOGY & INNOVATION MANAGEMENT
IMPERIAL COLLEGE BUSINESS SCHOOL, LONDON (UK)**

PERSONAL DETAILS

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Google Scholar profile: <http://scholar.google.co.uk/citations?user=63Sq3e0AAAAJ&hl=en>

EMPLOYMENT

Since 2009 **Imperial College Business School, London (UK)**
Innovation Studies Centre, Innovation & Entrepreneurship Group
- Associate Professor: Since September 2017
- Assistant Professor: April 2013 – July 2017
- Research Fellow: March 2011 – March 2013
- Research Associate: April 2009 – March 2011
Visiting period: Rotman School of Management, Toronto
on invitation of Bill McEvily (Feb – May 2014)

Since 2016 **ETH Zürich (Switzerland)**
Department of Management, Technology & Economics (MTEC)
- 20% appointment as Senior Researcher

QUALIFICATIONS

2005 – 2009 **PhD in Economic Geography (Utrecht University)**
Title: “The structure and dynamics of knowledge networks: a proximity approach”
Supervisors: Prof. Ron A. Boschma (Utrecht University)
Prof. Koen Frenken (Eindhoven University of Technology)
Date of PhD submission / defence: March 1, 2009 – November 19, 2009
Visiting period: OFCE-DRIC, Sophia-Antipolis (France), 2006

2001 – 2005 **MSc in Economic Geography (Utrecht University)**
Cum laude (highest distinction in the Netherlands)
Erasmus exchange: University of Bari (Italy), 2005

RESEARCH

REFEREED FULL PAPERS

1. **Ter Wal, A.L.J.**, Criscuolo, P. & A. Salter (2017), Making a marriage of materials: the role of gatekeepers and shepherds in the absorption of external knowledge and innovative performance. *Research Policy* 46 (5): 1039-1054 ([doi](#)).
Citations in Google Scholar: 2
2. Bogers M., Zobel A.-K., Afuah A., Almirall A., Brunswicker S., Dahlander L., Frederiksen L., Gawer A., Gruber M., Haefliger S., Hagedoorn J., Hilgers D., Laursen K., Magnusson M., Majchrzak A., McCarthy I.P., Moeslein K.M., Nambisan S., Piller F.T., Radziwon, A., Rossi-Lamastra C., Sims J. & **Ter Wal A.L.J.** (2017), The open innovation research landscape: established perspectives and emerging themes across different levels of analysis. *Industry & Innovation* 24 (1): 8-40 ([doi](#)).
Citations in Google Scholar: 114 – Citations in Scopus: 45
3. **Ter Wal, A.L.J.**, O. Alexy, J. Block & P. Sandner (2016), The best of both worlds: the benefits of open-specialized and closed-diverse syndication networks for ventures' success. *Administrative Science Quarterly*, 61 (3): 393-432 ([doi](#)).
Citations in Google Scholar: 34 - Citations in Scopus: 5
4. Salter, A., **A.L.J. Ter Wal**, P. Criscuolo & O. Alexy (2015). Open for ideation: individual-level openness and idea generation in R&D. *Journal of Product Innovation Management*, 32 (4): 488-504 ([doi](#)).
Citations in Google Scholar: 67 - Citations in Scopus: 23
5. Hardeman, S., K. Frenken, Ö. Nomaler , **A.L.J. Ter Wal**, Characterizing and comparing innovaiton systems by different “modes” of knowledge production: A proximity approach.. *Science & Public Policy*, 42 (4): 530-548 ([doi](#)).
Citations in Google Scholar: 28 - Citations in Scopus: 7
6. Criscuolo, P., A. Salter, **A.L.J. Ter Wal** (2014). Going underground: bootlegging and individual innovative performance. *Organization Science*, 25 (5): 1287-1305 ([doi](#))¹.
Citations in Google Scholar: 68 - Citations in Scopus: 28
7. **Ter Wal A.L.J.** (2014). The dynamics of the inventor network in German biotechnology: geographical proximity versus triadic closure. *Journal of Economic Geography*, 14 (3): 589-620 ([doi](#)).
Paper selected for the Best Papers Proceedings, 2010 Academy of Management.
Citations in Google Scholar: 192 - Citations in Scopus: 48
8. Salter, A., P. Criscuolo & **A.L.J. Ter Wal** (2014), Coping with open innovation: individual responses and organizational practices to the challenges of external engagement in R&D. *California Management Review* 54 (2), 77-94 ([doi](#))¹.
Citations in Google Scholar: 106 - Citations in Scopus: 45

¹ The authors have contributed equally to this paper.

9. **Ter Wal, A.L.J.** (2013), Cluster emergence and network evolution: a longitudinal analysis of the inventor network in Sophia-Antipolis. *Regional Studies*, **47** (5): 651-668 ([doi](#)).
Citations in Google Scholar: 109 - Citations in Scopus: 31
10. Alexy, O., J. Block, P.G. Sandner, **A.L.J. Ter Wal** (2012), The social capital of venture capitalists and start-up funding. *Small Business Economics*, 39 (4): 835-851 ([doi](#))¹.
Paper selected for the Best Papers series "Frontiers of Entrepreneurship Research" of the 2010 Babson College Entrepreneurship Research Conference.
Citations in Google Scholar: 84 - Citations in Scopus: 24
11. Cassi, L., A. Morrison & **A.L.J. Ter Wal** (2012), The evolution of trade and scientific collaboration networks in the global wine sector. *Economic Geography*, 88 (3): 331-334 ([doi](#))¹.
Citations in Google Scholar: 54 - Citations in Scopus: 16
12. **Ter Wal, A.L.J.** & R.A. Boschma (2011), Co-evolution of firms, industries and networks in space. *Regional Studies* 45 (7): 919-933 ([doi](#)).
Citations in Google Scholar: 394 - Citations in Scopus: 156
13. Cantner, U., A. Meder & **A.L.J. Ter Wal** (2010), Innovator networks and regional knowledge base. *Technovation* 30 (9-10): 496-507 ([doi](#)).
Citations in Google Scholar: 111 - Citations in Scopus: 47
14. **Ter Wal, A.L.J.** & R.A. Boschma (2009), Applying social network analysis in economic geography: framing some key analytic issues. *Annals of Regional Science* 43 (3): 739-756 ([doi](#)).
Citations in Google Scholar: 491 - Citations in Scopus: 224
15. Boschma, R.A. & **A.L.J. Ter Wal** (2007), Knowledge networks and innovative performance in an industrial district: the case of a footwear district in the South of Italy. *Industry and Innovation* 14 (2): 177-199 ([doi](#)).
Citations in Google Scholar: 666 - Citations in Scopus: 282

WORK IN PROGRESS

16. **Ter Wal, A.L.J.**, P. Criscuolo, B. McEvily, A. Salter – Dual networking: how to leverage second-order social capital for innovation.
17. Criscuolo, P., M. Haas, A. Salter & **A.L.J. Ter Wal** – Performance of innovation managers in a multi-divisional firm: the implications of transfers across divisions.
18. Dioszegi B., **A.L.J. Ter Wal**, & V. Tartari, D. Laureiro-Martínez & S Brusoni - Understanding information search through an interactive networking game.
19. R. Gerges-Yammine & **A.L.J. Ter Wal** – Immune to social contagion? The effects of inter-organizational imitation and power on exit decisions from multi-party alliances.
20. R. Gerges-Yammine, **A.L.J. Ter Wal** & N. Malhotra – Network behaviours and the entrepreneurial journey.
21. Tartari, V. & **A.L.J. Ter Wal**. Bridging the gap: Network activation and mobilization of boundary-spanners across the industry-academia divide.

INDUSTRIAL COLLABORATIONS

- “Enabling Breakthroughs through Innovation Leadership”, with Paola Criscuolo (Imperial College Business School) and Ammon Salter (Bath School of Management). In collaboration with a large multinational, pseudonym Neptune (since 2010).
- “Identity, Networks, and Corporate Entrepreneurship”, with Bart Clarysse (ETH Zurich), in collaboration with Swisscom (since 2016).
- “Bridging the gap”, with Valentina Tartari (Copenhagen Business School). In collaboration with a large pharmaceutical company.

OVERALL CITATIONS

Scopus: total number of citations received: 982 – citations received over 2017: 165

Google Scholar: total number of citations: 2533 – citations received over 2017: 374

RESEARCH RECOGNITION AND AWARDS

- 2018/08 **Recognition for Outstanding Performance as Member of the Editorial Review Board of the *Academy of Management Journal*.** August 2018.
- 2018/04 **Academy of Management Best Paper Proceedings.** – *The relative value of the division versus duplication of networks for innovation performance.* TIM Division, Academy of Management.
- 2016/08 **Recognition for Outstanding Performance as Member of the Editorial Review Board of the *Academy of Management Journal*.** August 2016.
- 2014/06 **Member of the Editorial Review Board of the *Academy of Management Journal*.** Since June 2014.
- 2013/06 **Runner-up for DRUID Best Paper award,** DRUID Summer Conference 2013, Barcelona
“*The best of both worlds: the benefits of specialized-brokered and diverse-closed syndication networks for venture success*”, with O. Alexy, J.H. Block & P. Sandner
- 2012/09 **The Regional Studies Association (RSA) Best Paper Award for Regional Studies 2012**
“*The co-evolution of firms, industries and networks in space*”, with R.A. Boschma
- 2012/08 **Best Reviewer Award,** Academy of Management, Technology and Innovation Management
- 2010/08 **Best Paper Proceedings,** 2010 Academy of Management
“*The dynamics of the inventor network in German biotechnology: geographical proximity versus triadic closure*”. Now published in: *Journal of Economic Geography*
- 2010/05 **Paper selected for the Best Papers series “Frontiers of Entrepreneurship Research”**
2010 Babson College Entrepreneurship Research Conference, “The social capital of venture capitalists and start-up”, with O. Alexy, J. Block & P. Sandner. Now published in: *Small Business Economics*

FUND RAISING

- 2016/09 **ERC Starting Grant**
European Research Council - € 1,334,616
March 2017 – February 2022
Title: Networking for innovation: how entrepreneurs' network behaviours help clusters to innovate
- 2012/05 **ESRC Future Leaders grant**
Economic and Social Research Council (ESRC) - £161,514
October 2012 – March 2015
Title: Strategic networking: how highly skilled professionals can best use their networks to drive innovation

TEACHING

MSC AND UNDERGRADUATE TEACHING:

- 2017-Sept, 2018-Feb & 2018-Sept Innovation Management, Discovering Management (ETH Zurich)
3-hour session
- 2013-2017, Jan/Feb Innovation Management, MSc Management (ICBS)
2-3 parallel streams of 20 hours and 80-90 students each stream
Teaching scores: 4.66/5 (2017), 4.51/5 (2016), 4.70/5 (2015), 4.69/5 (2014),
4.02/5 (2013)
- 2015, Oct/Dec Innovation Management, Business for Professional Engineers and Scientists
(ICBS, undergraduates)
20 hours and 120 students
Teaching scores: 4.45/5
- 2007 & 2008, Sept/Oct Geography of Networks, BSc Human Geography & Planning,
Utrecht University, 40 students, 50 hours.
Teaching scores: 4.4/5 (2008), 4.2/5 (2007)

MRES/PHD TEACHING:

2016-18, Jan-Feb	Readings in Innovation Management, MRes programme (ICBS) 10 hours and 6 students (2016) – 20 hours and 3 students (2017 and 2018) Teaching score: 4.92/5 (2016), 5.00/5 (2017), 5.00/5 (2018)
2013, Sep & 2012, Nov	UK-IRC Networks & Innovation Training Programme For international PhDs, post-docs and early-career faculty Teaching scores: 4.74/5 (2013), 4.58/5 (2012)
2013-2015	Techniques in Quantitative Research Methods”, Doctoral Programme. Guest contribution, 2 hours. 12 Students.

MBA TEACHING:

2018, March	Elective “Strategic networking for innovation and change”, Teaching score: 4.67/5
2017, May	Elective “Strategic networking for innovation and change”, Teaching score: 4.87/5
2016, May	Workshop “Strategic networking for innovation and change”, to be run as 4-day elective in June 2017
2011-2017, Summer	Supervision of several MBA students per year

EXECUTIVE EDUCATION:

2018, February	Session “Networking for innovation”, NEOMA Business School, programme hosted at Imperial College Business School
2017, November	Session “Strategic networking”, Royal Society
2016, February	Open programme, “Strategic Innovation” Session, “People Networks & Innovation, 15 participants
2015, September	Executive Education, Session: “Leveraging social networks for driving organizational change”, 27 participants from technology-based multinational.
2013, January	Executive Education, Session: “Leveraging social networks” EITF Young Leaders group.

PHD SUPERVISION AND EXAMINATION

Since 2013	Sophia Lu, “Academic celebrity: attention of academics in the media” PhD viva passed with minor revisions in June 2018
Since 2017	Lisa Makarova “Entrepreneurial networking in accelerators”.
September 2018	External examiner, Agnieszka Nowinska, Copenhagen Business School

TEACHING RECOGNITION AND AWARDS

2014-2015 Dean's Teaching Excellence Award for MSc Core Module Teaching an award based on a polling of students across Imperial College Business School's MSc Programmes

EXTERNAL TEACHING

2018, February "Strategic Networking", workshop for ESADE alumni in Munich (2 hours)
2017, November Novo Nordisk Career Day, Network training session for science PhDs and post-docs
2017, May "The Innovative Firm", PhD course, NORSI (co-taught with Bill Lazonick, Rajneesh Narula & Grazie Santangelo). BI Business School, Oslo (6 hours).
2014, July Teaching session "Entrepreneurial initiative in large organizations", European Entrepreneurship Consortium, EFER European Forum for Entrepreneurship Research. Brussels.

ORGANIZED CONFERENCES, INVITED SEMINARS, AND OTHER ACTIVITIES

RECENT ORGANIZED EVENTS:

- 2nd Innovation & Entrepreneurship Conversation, Imperial College Business School, theme "Organizing for innovation", co-organized with Paola Criscuolo and Ileana Stigliani. 20 international participants. June 2016.
- Organized international academic Paper Development Workshop "Networks and Formal Organization", co-organized with Bill McEvily (Rotman, Toronto). 20 participants from Europe and North America. January 2015.
- Organization of Professional Development Workshop "Networks and Innovation: Avenues of Future Research", Academy of Management, Philadelphia. August 2014.
- Organization of Professional Development Workshop "Autonomy, creativity, and innovation", DRUID Society Conference 2014, Copenhagen. June 2014.

RECENT INVITED SEMINARS:

- Invited speaker at Symposium on Digitalization. AOM Big Data, Specialized Conference, University of Surrey Business School, April 2018.
- Invited seminar, Max Planck Institute, Munich, February 2018
- Invited seminar, University of Stavanger, December 2017
- Parallel keynote "Directions", DRUID Summer Conference, NYU New York, June 2017. joint with Paola Criscuolo

- Invited seminar, SKEMA Business School, Sophia-Antipolis, April 2017.
- Invited seminar, EPFL Lausanne. February 2017.
- Invited seminar, Erasmus University Rotterdam. November 2016.
- Invited seminar, Tilburg University. November 2016.
- Invited seminar, Copenhagen Business School. October 2016.
- Invited seminar, ESSEC. October 2016.
- Invited seminar, ESMT Berlin. October 2015.
- Invited seminar, Jena Graduate School "Human Behaviour in Social and Economic Change" University of Jena. July 2015.
- Invited participant to workshop on Open Innovation, Chalmers University (Gothenburg, Sweden). 15 participants. 25-26 May 2015.
- Invited seminar, CASS Business School, City University, London. April 2015.
- Invited seminar, Rotman School of Management, University of Toronto, "The best of both worlds: the benefits of brokered-specialized and closed-diverse networks for venture success" (paper with Oliver Alexy, Jörn Block, Philipp Sandner). During 3-month research visit, February 2014.
- Invited seminar, University of Padova. March 2013.
- Invited seminar, Oxford Internet Institute, University of Oxford. February 2013.

RECENT CONSULTANCY:

- White City White Paper, for Stanmore/dnco property developers "White City – London's new Innovation District: Creating opportunities in a world-class ecosystem". August-September 2016.
- Consultancy study for Imperial College: "Imperial West as a world-leading Innovation District: A guide to best practice and feasibility". On the basis of a review of the academic literature and a field study of national and international examples of technology clusters. April 2013-April 2014.

RECENT OUTREACH:

- Forbes article, "Just something I've been working on... Why the best product discoveries are made by lone wolves" (with Paola Criscuolo). Forbes, 6 April 2018 ([link](#)).
- Three articles in the Business School's series of "IB Knowledge" business insight" articles (with help of ghost writer journalist Helena Pozniak):
 - *"Don't cramp my style! Why people are more creative on their own time"* - 30 October 2017 ([link](#)).
 - *Why every company needs its shepherds – steering external ideas to become internal innovations* ([link](#)) – 4 July 2017
 - *Where are we going wrong with our networking?* ([link](#)) – 29 March 2017

LANGUAGE PROFICIENCY

- Dutch (native language),
- English (fully proficient level),
- Italian (advanced level),
- German (intermediate level)
- French (intermediate level),

SELECTION OF FIVE KEY PAPERS: ABSTRACTS

Ter Wal, A.L.J., Criscuolo, P. & A. Salter (2017), Making a marriage of materials: the role of gatekeepers and shepherds in the absorption of external knowledge and innovative performance. *Research Policy* 46 (5): 1039-1054 ([doi](#)).

Through interviews and a large-scale survey of R&D scientists and engineers, this paper explores individuals' attempts to absorb external knowledge, focusing on their efforts to identify and assimilate external knowledge and promote its utilization. Extant research does not explicitly address whether individuals should better specialize in certain absorption efforts or rather work as generalists dedicated to a range of efforts. We suggest that assimilation efforts increase the value of individuals' efforts at external search and at promoting the utilization of external knowledge, which culminates in two main individual absorption roles that help individuals achieve greater innovation performance. We argue that *gatekeepers* who combine external search with assimilation effort help to achieve innovation by contributing to building potential absorptive capacity, while *shepherds* who combine assimilation with utilization effort aid innovation by building realized absorptive capacity. We find support for these predictions and discuss the implications for research and managerial practice in open innovation.

Ter Wal, A.L.J., O. Alexy, J. Block, P. Sandner (2016). The best of both worlds: the benefits of open-specialized-brokered and closed-diverse syndication networks for venture success. *Administrative Science Quarterly*, 61 (3): 393-432 ([doi](#)).

Open networks give actors non-redundant information that is diverse, while closed networks offer redundant information that is easier to interpret. Integrating arguments about network structure and the similarity of actors' knowledge, we propose two types of network configurations that combine diversity and ease of interpretation. Closed-diverse networks offer diversity in actors' knowledge domains and shared third-party ties to help in interpreting that knowledge. In open-specialized networks, structural holes offer diversity, while shared interpretive schema and overlap between received information and actors' prior knowledge help in interpreting new information without the help of third parties. In contrast, actors in open-diverse networks suffer from information overload due to the lack of shared schema or overlapping prior knowledge for the interpretation of diverse information, and actors in closed-specialized networks suffer from overembeddedness because they cannot access diverse information. Using CrunchBase data on early-stage venture capital investments in the U.S.

information technology sector, we test the effect of investors' social capital on the success of their portfolio ventures. We find that ventures have the highest chances of success if their syndicating investors have either open-specialized or closed-diverse networks. These effects are manifested beyond the direct effects of ventures' or investors' quality and are robust to controlling for the possibility that certain investors could have chosen more promising ventures at the time of first funding.

Criscuolo, P., A. Salter, **A.L.J. Ter Wal** (2014). Going underground: bootlegging and individual innovative performance. *Organization Science*, 25 (5): 1287-1305 ([doi](#)) ².

To develop innovations in large, mature organizations, individuals often have to resort to underground, "bootleg" research and development (R&D) activities that have no formal organizational support. In doing so, these individuals attempt to achieve greater autonomy over the direction of their R&D efforts and to escape the constraints of organizational accountability. Drawing on theories of proactive creativity and innovation, we argue that these underground R&D efforts help individuals to develop innovations based on the exploration of uncharted territory and delayed assessment of embryonic ideas. After carefully assessing the direction of causality, we find that individuals' bootleg efforts are associated with achievement of high levels of innovative performance. Furthermore, we show that the costs and benefits of bootlegging for innovation are contingent on the emphasis on the enforcement of organizational norms in the individual's work environment; we argue and demonstrate empirically that the benefits of an individual's bootlegging efforts are enhanced in work units with high levels of innovative performance and which include members who are also engaged in bootlegging. However, during periods of organizational change involving formalization of the R&D process, individuals who increase their bootlegging activities are less likely to innovate. We explore the implications of these findings for our understanding of proactive and deviant creativity.

Ter Wal A.L.J. (2014). The dynamics of the inventor network in German biotechnology: geographical proximity versus triadic closure. *Journal of Economic Geography*, 14 (3): 589-620 ([doi](#)).

Economic geography has developed a stronghold analyzing how geography impacts innovation. Yet, despite increased interest in networks, a critical assessment of the role of geography in the evolution of networks is still lacking. This article attempts to explore the interplay between geographic distance and triadic closure as two main forces that drive the evolution of collaboration networks. Analyzing the evolution of inventor networks in German biotechnology, the article theoretically argues and empirically demonstrates that—as the technological regime of an industry changes over time—inventors increasingly rely on network resources by forming links to partners of partners, while the direct impact of geographic distance on tie formation decreases. Although initially triadic closure reinforces the geographic distance effect by closing triads among proximate inventors, over time triadic closure becomes an increasingly powerful vehicle to generate longer distance collaboration ties as the effect of geographic proximity decreases.

² The authors have contributed equally to this paper.

Salter, A., P. Criscuolo & **A.L.J. Ter Wal** (2014), Coping with open innovation: individual responses and organizational practices to the challenges of external engagement in R&D. *California Management Review* 54 (2), 77-94 ([doi](#))².

Open innovation often requires wholesale changes to the nature of R&D. However, academic research and managerial practice have paid little attention to the challenges that individuals face in the daily pursuit of open innovation. As a result, there is little understanding of how individuals cope with open innovation, and which organizational practices can support them in this role. Drawing on the experiences of R&D professionals, this article identifies four specific challenges and coping strategies of individuals engaged in open innovation. It proposes a range of open innovation practices that organizations can implement to better equip their staff to undertake effective external engagement.