Research Proposal in the area of **ENTREPRENEUSHIP**

TITLE: **FAMILY FIRMS AND INNOVATION: DO THEY REALLY UNDERPERFORM DURING RECESSION?**

Economist who presents the proposal:

ELENA CEFIS (University of Bergamo and L.E.M., Sant'Anna School of Advanced Studies, Pisa, Italy)

Research team: CRISTINA BETTINELLI (University of Bergamo and Cambridge Family Enterprise Group, Boston)

Family firms are often considered to be traditional firms that shy away from looking for new opportunities, that follow conservative approaches, and that ultimately are less innovative than other types of firms (Economist, 2009). At the same time, however, family firms are the predominant form of business organization worldwide (Family Firm Institute, 2015[1], Faccio & Lang, 2002; Holderness, 2009; La Porta, Lopez-de-Silanes, & Shleifer, 1999) and make important contributions to gross national products, job generation, and wealth creation (Beckhard & Dyer, 1983; Feltham, Feltham, & Barnett, 2005; Kelly, Athanassiou, & Crittenden, 2000; Shanker & Astrachan, 1996). In addition, and even more important, evidence reveals that more than half of the most innovative large European firms are controlled by family owners (Forbes 2014[2]).

Because of the above reasons, economists, scholars in general, and entrepreneurs agree that an advanced understanding of their innovation behavior is pressing (Duran et al., 2015; Classen et al., 2014; Hsu et al., 2015)

Extant empirical literature has started to investigate family firms' innovation behavior, but findings seem to be still inconclusive. In particular, while some provide empirical evidence for a negative relationship between family firms and innovation (Block, 2012; Chen & Hsu, 2009; Chrisman & Patel, 2012; Munari, Oriani, & Sobrero, 2010), others find positive associations (Gudmundson, Tower, & Hartman, 2003; Kim, Kim, & Lee, 2008; Llach & Nordqvist, 2010). Moreover, as Duran et al (2015) note, from a theoretical point of view, previously applied theories fall short in explaining family firm innovation. For example, prior use of behavioral agency theory to family firm innovation (Chrisman & Patel, 2012) suggests that family firms typically underinvest in research and development (R&D) but cannot offer an explanation of the large number of innovative family firms that exist nowadays (Duran et al., 2015). On the other hand, the resource-based view (Barney, 1991), offers an explanation to several resource orchestration advantages of family firms (Sirmon, Hitt, Ireland, & Gilbert, 2011) but fails to explain family firms' low level of investment in innovation.

Furthermore, in the literature it is still lacking whether these peculiar resources of family firms are beneficial during severe downturns or they represent obstacles to firms' innovation and, in general, to firms' performance, as it is perceived analysing firms' survival statistics.

To shed light on this puzzling effects, we propose an empirical analysis that aims to understand how family involvement affects firm's innovation during recession time. In particular, we aim:

- to understand whether family involvement in the ownership or in the management affects firm's investment in innovation activities and whether the interaction effects of family involvement in management *and* ownership enhance or inhibit innovation investment.
- to investigate whether different type of family involvement in the governance of the firms affects its innovative performance conditionally to the investment done in innovative activities.
- to highlight the different innovation behavior between family and non-family firms during normal times and during recession.

In order to pursue these aims, we will perform an empirical study that:

- focuses on a representative sample of almost 3,000 high tech manufacturing firms in Italy during the period 2003 -2014;

[1] Available at http://www.ffi.org/?page=GlobalDataPoints

[2] Available at http://www.forbes.com/innovative-companies/list/

- integrates important data on innovation and on governance of firms. Concerning innovation, we will consider both the input side - R&D and intangible assets divided by typology, and on the output side – number of patents weighed by their citations, patents' technological classes and its level of "entropy"[3], and new products commercialized. With regard to the governance of firms, we will use precise indicators of the family involvement considering the extent of involvement in the ownership in a continuous way and in the management (including analysis of CEO/President roles, and of the board of directors' structure). These proxies go well beyond the usual dichotomous family ownership measure usually implemented in the existent literature offering a more complete view of the phenomenon under study;
- our models will also include a number of relevant control variables that have been overlooked so far by extant empirical literature. Variables will include: firm level characteristics like size, sector of the main activity (SIC code at 4/6 digits), geographical location (region and North, Centre, South Italy dummy) and all the data coming from the financial statements that we will consider relevant to the analysis; industry level characteristics like a proxy for concentration; time dummy variables.

The study will implement robust econometric analysis on a longitudinal basis in order to analyze the relationship between family involvement in the ownership and in the management of the firm and its innovation investment and performance. Among other methods, we will apply Propensity Score Matching Models that allow us to reduce the selection bias and strengthen the causal argumentation, in order to analyze innovation family business behavior with respect to non-family business one.

The added value of this study can be summarized in the following points:

- to our knowledge it is one of few studies to explore the relationship between different type of family involvement in the business and innovation on an extensive representative sample of high-tech firms and in a longitudinal manner;
- our models will be based on indicators, both for the innovation side and for the family involvement that better capture the two phenomena distinguishing among different phases of the innovation process inside the firm and among different types of family involvement in the governance of the firm;
- given our time span is across the last recession due to the "first" (the subprime mortgage crisis 2008-2010) and "second" crisis (the European 2010 debt crisis started in 2010) we will be able to discern whether family firms are able to face the challenge of the market better than non-family firms in terms of innovative performance.

By doing so we are able to show that:

- Family firms are distinct from non-family firms with regard to their behaviour in innovation activities and their innovative performance
- Family firms are not a homogeneous group (Chua et al., 2012) since the behaviour of family firms with a family member as CEO or with the majority of board positions covered by family members differs from that of family firms with an external CEO or with less board positions covered by family members (Miller et al., 2014). We expect that this heterogeneity will be reflected on the role of different firm leadership types in explaining firms' innovation process
- Different types of involvement in the governance of the firm will affect innovation investment and performance in completely different ways.
- Family firms are distinct from non-family firms in coping with global crisis and that different types of family firms react very differently, at least in terms of innovative behavior and performance, to severe downturns.

(The funds will be mainly used to gather the data and to hire a research assistant that would help us to clean the data and to extract the accurate information on family involvement and on innovation proxies)

[3] The "entropy" as a proxy for the potential spill-over in other sectors. The series of firms' patents goes back to 1978.

References :

Barney, J., 1991. Firm resources and sustained competitive advantage. ***Journal of Management***, 17(1): 99–120.

Beckhard, R., & Dyer, W. G., 1983. SMR forum: Managing change in the family firm: Issues and strategies. ***Sloan Management Review***, 24(3): 59-65.

Block, J. H., 2012. R&D investments in family and founder firms: An agency perspective. ***Journal of Business Venturing***, 27(2): 248–265.

Chen, H.-L., & Hsu, W.-T., 2009. Family ownership, board independence, and R&D investment. ***Family Business Review***, 22(4): 347–362.

Chrisman, J. J., & Patel, P., 2012. Variations in R&D investments of family and non-family firms: Behavioral agency and myopic loss aversion perspectives. ***Academy of Management,*** 55: 976-997.

Chua, J. H., Chrisman, J. J., Steier, L. P., & Rau, S. B., 2012. Sources of heterogeneity in family firms: An introduction. ***Entrepreneurship Theory and Practice***, 36(6): 1103–1113.

Classen, N., Carree, M., Van Gils, A., & Peters, B., 2014. Innovation in family and non-family SMEs: An exploratory analysis. ***Small Business Economics****, 42*(3): 595-609.

Duran, P., Kammerlander, N., Van Essen, M., & Zellweger, T., 2015. Doing more with less: Innovation input and output in family firms. ***Academy of Management Journal***, amj.2014.0424; published ahead of print May 1, 2015.

Economist. 2009. Dynasties and durability. http://www.economist.com/node/14517406.

Faccio, M., & Lang, L. H. P., 2002. The ultimate ownership of Western European corporations. ***Journal of Financial Economics***, 65: 365-395.

Feltham, T. S., Feltham, G., & Barnett, J. J., 2005. The dependence of family businesses on a single decisionmaker. ***Journal of Small Business Management***, 43: 1-15.

Gudmundson, D., Tower, C. B., & Hartman, E. A., 2003. Innovation in small businesses: Culture and ownership structure do matter. ***Journal of Developmental Entrepreneurship***, 8(1): 1–17.

Holderness, C. G., 2009. The myth of diffuse ownership in the United States. ***Review of Financial Studies***, 22: 1377-1408.

Hsu, P., Huang, S., Massa, M., & Zhang, H., 2015. *The new lyrics of the old folks: The role of family ownership in corporate innovation,* C.E.P.R. Discussion Papers: 10445.

Kelly, L. M., Athanassiou, N., & Crittenden, W. F., 2000. Founder centrality and strategic behavior in the family owned firm. ***Entrepreneurship Theory and Practice***, 25(2): 27-42.

Kim, H., Kim, H., & Lee, P. M., 2008. Ownership structure and the relationship between financial slack and R&D investments: Evidence from Korean firms. ***Organization Science***, 19(3): 404–418.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A., 1999. Corporate ownership around the world. ***Journal of Finance***, 54: 471-517.

Llach, J., & Nordqvist, M., 2010. Innovation in family and non-family businesses: A resource perspective. ***International Journal of Entrepreneurial Venturing***, 2(3): 381–399.

Miller, D., Le Breton-Miller, I., Minichilli, A., Corbetta, G., & Pittino, D., 2014. When do nonfamily CEOs outperform in family firms? Agency and behavioural agency perspectives. ***Journal of Management Studies***, 51(4): 547–572.

Munari, F., Oriani, R., & Sobrero, M., 2010. The effects of owner identity and external governance systems on R&D investments: A study of Western European firms. ***Research Policy***, 39(8): 1093–1104

Shanker, M. C., & Astrachan, J. H., 1996. Myths and realities: Family businesses' contribution to the U.S. economy—A framework for assessing family business statistics. ***Family Business Review***, 9: 107-123.

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A., 2011. Resource orchestration to create competitive advantage breadth, depth, and life cycle effects. ***Journal of Management***, 37(5): 1390–1412.

CV - Curriculum Vitae **April 2016**

ELENA CEFIS

Associate Professor in Applied Economics

Office: Dep. of Management, Economics and Quantitative Methods
University of Bergamo — Tel. +39.035.2052.683
Via dei Caniana 2 — Fax +39.035.2052.549
24127 Bergamo, Italy — E-mail: elena.cefis@unibg.it

Associate Research Fellow:
L.E.M. - Laboratory of Economics and Management,
St. Anna School of Advanced Studies,
Piazza Martiri della Liberta', 33
56127 Pisa, Italy — Homepage: **www.elenacefis.com**

Fluent in Italian, English and Spanish. Working knowledge in French.

Education:

2000: **Ph.D. in Economics**, European University Institute, Florence.
Dissertation title: *Persistence in innovative activities. An empirical analysis.*
Examination committee: Paul Geroski, Soren Johansen, Franco Malerba, Luis Phlips.

1995: **Ph.D. in History** (with 'Honors'), European University Institute, Florence.
Dissertation title: *Technological and Organizational discontinuities in the complex System Industry: the Case of High Speed Trains in Italy.* Examination committee: Albert Carreras, Giovanni Dosi, Renè Leboutte, Luigi Orsenigo, Giuseppe Tattara.

1989: **Laurea in Economics** (cum Laude), Bocconi University, Milan.

Academic Positions:

December 2013 "**Abilitazione Scientifica Nazionale" as Full Professor** (Professore Ordinario di I fascia) in
SECS-P/02: Economic Policy
SECS-P/06: Applied Economics

Academic years 2011/12 and 2012/13: **on leave for family reasons.**

2006 – present: **Associate Professor in Applied Economics**, Department of Economics, University of Bergamo

2004 – 2006 : **Assistant Professor in Organisational Economics**, Utrecht School of Economics, Utrecht University

2000 – 2004: **Assistant Professor in Economic Policy**, Department of Economics, University of Bergamo.

1997 – 1999: **Post-Doc in Economics**, Department of Economics, Pompeu Fabra University, Barcelona, Spain. European Community Marie Curie Training and Mobility of Researchers Grant

1996 – 1997: **Post-Doc in Economics** , Department of Economics, University of Trento., Trento, Italy

Other Positions:

2016 – 2017: **Member of the Professors Board** of the **Ph.D. Program**: "Economics and Management of Technology (DREAMT)", organized by Bergamo Universiy jointly with Pavia University.

2016: **Member of the Advisory Board** of **SmartEIZ** twinning project financed by the **Horizon 2020 programme** for research and innovation project. Partner institutions are UNU MERIT, Maastricht (director – prof. B. Verspagen), UCL London (prof. S. Radosevic), Institute of Economics, Zagreb (EIZ) and University Bocconni, Milan (prof. R. Mavilia and prof. F. Malerba).

1989 – 1991: **Consultant** (especially with regard to applications for European Union funds by small-medium firms) in a consulting firm managed by Dr. L. Ruffini, Bergamo

Journal board positions

Associate Editor of the Journal: *Industrial and Corporate Change*, Oxford University Press.

Member of the Executive Board of the Journal: *Industrial and Corporate Change* (since 2005)

Guest Editor of the Special Issue: *"***Industrial Dynamics and Economic Geography***",* *Regional Studies,* 2015

Guest Editor of the Special Issue: *"***Revolving Doors: Entrepreneurial Survival end Exit***",* *Journal of Evolutionary Economics,* 2012

Research activities

Research Affiliations and Memberships

2000 – present: Associate Research Fellow at **L.E.M. - Laboratory of Economics and Management**, St. Anna School of Advanced Studies, Pisa, Italy

2011 (Jan) – 2012 (Aug): Research Fellow at **Urban and Regional research centre Utrecht (URU)**, Utrecht University, the Netherlands

2003(Nov) – 2010 (Dec): Research Fellow at **T.C Koopmans Research Institute**, Utrecht School of Economics (USE), Utrecht University, the Netherlands

2000 – 2012: Member of the **International Schumpeter Society (ISS).**

2008 – 2012: Member of the **European Network on the Economics of the Firm (ENEF).**

2007 – 2012: Member of the **Società Italiana di Economia e Politica Industriale (SIEPI).**

Visiting Positions

2003 Nov. - 2004 July: Visiting Scholar at the **T.C. Koopmans Institute, Utrecht School of Economics,** Utrecht University (on leave from Bergamo University)

2003 – May-October: Visiting Scholar at the **Rotterdam School of Management, Erasmus University Rotterdam** (on leave from Bergamo University)

2000 – 2005: Visiting Fellow at **ISTAT** (Italian National Statistical Office), Rome, Italy

1997 July**:** Visiting Fellow at **NBER** (National Bureau of Economy Research), **Productivity Group Workshops** organised by Zvi Griliches, Cambridge-MA.

1994: Research assistant of Prof. Albert **Carreras**, **European University Institute**, Florence.

1991 - 1996: Researcher at **CESPRI** (Centro Studi sui Processi di Internazionalizzazione), Project Title: *Progetto Alta Velocità – gli effetti sul sistema economico*, Bocconi University, Milan.

Research Fields

Innovation studies, Management of technology and innovation, Industrial Dynamics, Entrepreneurship, Applied Microeconomics , Industrial Organization, Evolutionary Economics

Fund Raising and Direction of peer reviewed, competitive research projects

2015 (Dec) – 2016 (Jun) **Agenzia Spaziale Italiana_ASI** research project: "**Survey sugli indicatori strutturali e di trend del settore Spazio italiano nel periodo 2010-14** ", financed by **ASI**, based at Department of Economics, University of Bergamo (25.000 euro).

2006 (Aug) – 2010 (Dec) **High Potential Programme** project: **"The Co-Evolution of Industrial Dynamics and Urban Growth",** financed by **Utrecht University**, based at Utrecht School of Economics (USE) and Urban and Regional research centre Utrecht (URU), Utrecht University, NL (180.000 euro).

2009 **Agenzia Spaziale Italiana_ASI** research project:, "**Prospettive ed effetti moltiplicativi degli investimenti nei settori ad alta tecnologia nelle economie avanzate, con particolare riferimento al settore spaziale in Europa**", financed by **ASI**, based at Department of Economics, University of Bergamo (167.000 euro).

2007 – 2009 **University of Bergamo** research project: "**The effects of Mergers and Acquisition on the firm innovation**", financed by University of Bergamo, based at Department of Economics, University of Bergamo (30.000 euro)

Grant funded research projects

2005 – 2008 **Team coordinator** in the project "**The Impact of M&A-driven market dominance on innovation dynamics" within the NWO Programme "Innovation Dynamics",** financed by the **NWO (National Research Committee of the Netherlands)**, based at Utrecht School of Economics, Utrecht University, Utrecht, the Netherlands

2005 – 2007: **Researcher** in the project: **Learning, Competitive Interactions and the Ensuing Patterns of Industrial Evolution**, financed by the Ministero dell'Università e della Ricerca Scientifica e Tecnologica, based at St. Anna School of Advanced Studies, Pisa (**MURST 40%**).

2004 - 2011: **Researcher** in the research project: **DIME NoE** (**Dynamics of Institutions and Markets in Europe** – **Network of Excellence**), sponsored by the 6th Framework Programme of the European Union.

2004 – 2005: **Researcher** in the project: **Synergies and Dynamic efficiencies in mergers,** financed by the Euorpean Commission, based at: **EIM, Business & Policy**

Research, Zoetermeer, the Netherlands.

2001 – 2004: **Researcher** in the project: ***Competitività dell'economia trentina: un approccio valutativo della relazione tre dinamica imprenditoriale e intervento pubblico***, funded by Provincia di Trento, based at the University of Trento, Trento.

2000 – 2001: **Researcher** in the project: **EPRIS** (European Pharmaceutical Regulation and Innovation Systems), funded by Merck Foundation, based at University of Florence, Florence.

1999 – 2001: **Researcher** in the project: ***Innovation and Industrial Performances: Microeconomic Evidence, Sectoral Patterns and Aggregate Dynamics,*** funded by Ministero dell'Università e della Ricerca Scientifica e Tecnologica (MURST ex 40%), based at "La Sapienza" University, Dep. of Economics, Rome

1999 – 2001: **Researcher** in the project: **ESSY** (Sectoral Systems in Europe: Innovation Competitiveness and Growth), funded by the European Union (program TSER, DG.XII, Grant n.soe1-ct98-1116) based at CESPRI, Bocconi University, Milan.

1997 – 2000: **Researcher** in the project: **DYNACOMM** (Dynamic Capabilities Growth and long term competitiveness of European Firms: a diagnosis and implication for EU policies), funded by the European Union (program. TSER, DG.XII, Grant n.soe1-ct97-1078), based at "La Sapienza" University, Dep. of Economics (The Coordinator), Rome.

Awards and Fellowships:

2015: **Best Paper:** The paper submitted to the 2015 Academy of Management Meeting (Augusta 7-11, Vancouver, Canada) has been judged one of the best accepted papers of the section ***Innovation and Tecnology Management.*** An abridged version is published in *Academy of Management Proceedings*, 2015(1), 17260.

2003, 2006, 2007, 2008, 2009, 2010; 2011; 2012; 2013; 2014; 2015: **Research Productivity Award** of the Department of Economics, University of Bergamo (a yearly award).

2006: "**Researcher of the year"** of the Utrecht School of Economics, Utrecht Universtiy, The Netherlands

2006: **High Potential Grant** of the Utrecht University (4 year grant)

1998 – 1999: European Union **Training and Mobility of Researchers** Grant, a **Marie Curie**

Post-Doc fellowship (2 year grant), at Pompeu Fabra University, Barcelona .

1998 **European Union Fellowship** for the **Summer School in Industrial Dynamics** ESSID, IMRI - Université de Paris, Dauphine.

1996 – 1998: **Post-Doc Grant**, Department of Economics, University of Trento, (2 year grant).

1994: **CIDE Fellowship** for the Advanced Summer School in Econometrics, University of Bologna.

Referee work:

Journals

Management Science
Review of Economics and Statistics
Journal of Management Studies
International Jour. of Industrial Organization
Industrial and Corporate Change
Economics of Innovation and New Technology
International Journal of the Economics of Business
Economia e Politica Industriale
Research Policy
The Economic Journal
Oxford Economic Papers
Journal of Evolutionary Economics
Small Business Economics
Regional Studies
Review of Industrial Organization
Empirical Economics
Taylor and Francis Books, Routledge

Istitutions:

Social Sciences and Humanities Research Council of Canada (2014)
DRUID (Danish Research Unit for Industrial Dynamics) *annual Summer Conference (since 2005)*

Publications:

Journal Articles:

1. Cefis E. and A. Triguero (2016), Make, Buy or Both: The Innovation Sourcing Strategy Dilemma after M&A, *Growth and Change*, published First Online: 2 Feb 2016 | DOI: 10.1111/grow.12146 (IF 0.642)

2. Capasso, M, E., Cefis, and K. Frenken (2015), Spatial Differentiation in Industrial Dynamics. The Case of the Netherlands (1994 – 2005), in *Tijdschrift voor Economische en Sociale Geografie*, published First Online: 1 July 2015 | DOI:10.1111/tesg.12150 (IF 1.096)

3. Cefis E., O. Marsili and D. Rigamonti (2015), Industry relatedness and post-acquisition innovative performance*, Best Paper Proceedings - Academy of Management*, 2015(1), 17260. doi:10.5465/AMBPP.2015.285

4. Cefis E., and O. Marsili (2015), Crossing the Innovation Threshold through Mergers and Acquisitions, in *Research Policy*, 44, 698-710. (IF 3.117)

5. Capasso M., E. Stam, E. Cefis (2015), Industrial Dynamics and Economic Geography, *Regional Studies,* 49(1), 5-9. (IF 2.068)

6. Frenken K., E. Cefis, E. Stam (2015), Industrial Dyanamics and Clusters: a Survey, *Regional Studies*, 49(1), 10-27. (IF 2.068)

7. Capasso, M, E. Cefis, and K. Frenken (2014), On the existence of persistently outperforming firms, *Industrial and Corporate Change,* 23(4), 997-1036. (IF 1.260)

8. Capasso, M, E. Cefis, and A. Sapio (2013), Reconciling quantile autoregressions of firm size and variance–size scaling. *Small Business Economics*, 41(3), 609-632. (IF 1.795)

9. Capasso, M, and E. Cefis (2012), Firms' Size and Variance of Growth Rates: the Effects of Data Truncation, in *Review of Industrial Organization*, 41(3), 193-205 (IF 0,870)

10. Cefis, E., and O. Marsili (2012), Going, going, gone. Exit forms and the innovative capabilities of firms, in *Research Policy*, 41(5), 795–807 (IF 2.850)

11. Cefis, E., and O. Marsili (2011), Born to Flip. Exit Decisions of Entrepreneurial Firms in High-tech and Low-tech industries*,* in *Journal of Evolutionary Economics,* 21(3), 473-498. (IF 1.036)

12. Cefis, E., and O. Marsili (2011), Revolving Doors: Entrepreneurial Survival and Exit**,** in *Journal of Evolutionary Economics*, 21(3), 367-372. (IF 1.036)

13. Cefis, E. (2010), The Impact of M&A on Technology Sourcing Strategies, in *Economics of Innovation and New Technology*, 19(1), 27-51 (IF 1.341)

14. Cefis, E., M. Ghita and A. Sabidussi (2009), Partnerships and Innovative Patterns in Small and Medium Enterprises, in *International Journal of Entrepreneurship and Small Business*, 7(4), 431-445.

15. Cefis, E. and R. Gabriele (2009), Spatial disaggregation patterns and structural determinants of job flows: an empirical analysis, in *International Review of Applied Economics*, 23(1), 89-111

16. Cefis, E., S. Rosenkranz and U. Weitzel (2009), Effects of coordinated strategies on product and process R&D, in *Journal of Economics,* 96(3), 193-222

17. Cefis, E., O. Marsili, and H. Schenk (2009), Mergers and the Evolution of the Firm Size Distribution, in *Journal of Evolutionary Economics*, 19(1), 1-20.

18. Cefis, E., M. Ciccarelli, L. Orsenigo (2007), Testing Gibrat's Legacy: A Bayesian Approach to Study the Growth of Firms, *Structural Change and Economic Dynamics*, 18(3), 348 – 369.

19. Bottazzi, G., E. Cefis, G. Dosi, A. Secchi (2007), Invariances and Diversities in the Evolution of Manufacturing Industries, *Small Business Economics*, 29 (1-2), 137-159.

20. Cefis, E., and R. Evangelista (2007), La valutazione delle politiche per l'innovazione: un confronto tra Italia e Paesi Bassi (The Evaluation of Innovation Policies: A Comparative Analysis between Italy and the Netherlands. With English summary.), in *L'Industria, Nuova-Serie,* 28(2), 243-264

21. Cefis, E., and O. Marsili (2006), Survivor: the Role of Innovation in Firms' Survival, *Research Policy*, 35 (5), 626-641.

22. Cefis, E., and O. Marsili (2005), A Matter of Life and Death: Innovation and Firm Survival, *Industrial and Corporate Change*, 14(6), 1167-1192.

23. Cefis, E. and M. Ciccarelli (2005), Profit Differentials and Innovation, *Economics of Innovation and New Technology*, 14(1-2), 43-61.

24. Cefis, E. (2003), Is there any Persistence in Innovative Activities?, *International Journal of Industrial Organization*, 21(4), 489-515.

25. Cefis, E. (2003), Persistence in Innovation and Profitability, *Rivista Internazionale di Scienze Sociali*, 110(1), 19-37.

26. Bottazzi, G., E. Cefis, G. Dosi (2002), Corporate Growth and Industrial Structure. Some Evidence from the Italian Manufacturing Industry, *Industrial and Corporate Change*, 11(4), 705-725**.**

27. Cefis, E. and L. Orsenigo (2001), The Persistence of Innovative Activities. A Cross-Countries and Cross-Sectors Comparative Analysis, *Research Policy*, 30(7), 1139-1158.

28. Cefis, E. (1990), Le origini e lo sviluppo di una nuova tecnologia nella produzione di orologi: la Waltham Watch Company, 1850-1883, *Annali di Storia dell'Impresa,* 5/6, 375-393.

Books

29. G. Graziola, E.Cefis, P.Gritti (2012) L*'industria spaziale italiana nel contesto europeo. I rendimenti degli investimenti in alta tecnologia*, Bologna: Il Mulino. (ISBN 978-88-15-15013-4)

30. M. Tozzi Fontana, E. Cefis, R.Palena, D. Valli, S. Nepoti (1992) *La Società Laterizi e l'arte del cotto a Imola*, Bologna: Il Mulino, ch.2, pp.31-139. (ISBN 88-15-04023-4)

Book chapters:

31. Cefis, E., F. Berlendis, R. Leoni (2008), "L'impresa nella teoria evolutiva", in R. Leoni (ed.), *Economia Dell'innovazione. Disegni organizzativi, pratiche lavorative e performance d'impresa,* Franco Angeli: Milano, ch. 2, pp. 37-70. (ISBN: 9878856801422)

32. Cefis, E. and O. Marsili (2006), "Innovation Premium and the Survival of Entrepreneurial firms", in E. Santarelli (ed.) *Entrepreneurship, Growth, and Innovation: The Dynamics of Firms and Industries*, Series: International Studies in Entrepreneurship, Springer, Heidelberg and New York, vol.12, ch. 9, pp.183-198. (ISBN: 0-387-28868-6)

33. Cefis, E., M. Ciccarelli, L. Orsenigo (2006), "Hetereogeneity in firms' growth in the pharmaceutical industry", in M. Mazzucato & G. Dosi (eds.) *Knowledge Accumulation and Industry Evolution. The Case of Pharma-Biotech*, Commented by Boyan Jovanovic, Cambridge University Press, Cambridge, UK, ch.6, pp. 163-207. (ISBN-10: 0521858224 | ISBN-13: 9780521858229)

34. Bottazzi, G., E. Cefis, G. Dosi, A. Secchi (2005), "Crescita dell' Impresa e Struttura Industriale: Evidenze Empiriche sull'Industria Manifatturiera Italiana", in D. Delli Gatti and M. Gallegatti, (eds.) *Eterogeneità degli Agenti Economici ed Interazione Sociale: Teorie e Verifiche Empiriche*, Ed. Il Mulino, Bologna, pp. 117-140 (ISBN 88-15-10246-9)

35. Cefis, E. and R. Gabriele (2004), "La creazione e distruzione dei posti di lavoro in un mercato a bassa disoccupazione", in Enrico Zaninotto (ed.) *Dimensione d'Impresa,Demografia Industriale e Occupazione in Trentino*, Ed.Trentuno, Trento, Parte Seconda, pp. 27-79 (ISBN 88-88224-17-3)

36. Cefis, E. (2004), "Innovazione e cambiamento nella struttura industriale. L'introduzione dell'elettronica di potenza e l'Alta Velocità", in A.Giuntini and C. Pavese (eds*.), Reti, Mobilità, Trasporti. Il Sistema Italiano tra Prospettiva Storica e Innovazione*, Ed. Franco Angeli, Milano, pp. 257-277 (ISBN 88-464-5628-9).

37. Antonicelli, P., F. Belussi, E. Cefis, E. Zaninotto (2002), "Dinamiche imprenditoriali e sviluppo locale", in R.Camagni e E.Zaninotto (eds.), *Competitività del sistema produttivo trentino*, Ed. Trentuno, Trento, pp. 41-82 (ISBN 88-88224-04-1).

38. Cefis, E. (1995), "Innovation Technologique, Standardisation et Intégration: le Case du Train á Grand Vitesse", in M.Merger, A.Carreras, A.Giuntini (eds.), *Les Réseaux Européens Transnationaux*. Ouest Editions, Nantes/Paris, pp. 318-336.

Ph.D. Theses

1. *Persistence in innovative activities. An empirical analysis.* Ph.D Thesis in Economics, European University Institute, Florence. Refereed by P. Geroski, S. Johansen, F. Malerba, and L. Phlips. Florence, December 1999.

2. *Technological and Organizational discontinuities in the complex Systems Industry: the Case of High Speed Trains in Italy.* Ph.D. in Economic History, European University Institute, Florence. Refereed by A. Carreras, G. Dosi, R. Leboutte, L. Orsenigo, and G. Tattara. Florence, December 1995.

Working papers

- Cefis, E., A. Sabidussi, and H. Schenk (2007), *Do mergers of potentially dominant firms foster innovation?An empirical analysis for the manufacturing sector* , WP n. 07-20, T.C. Koopmans Institute, Utrecht School of Economics, Utrecht University, Utrecht.

- Cefis, E., M. Grondsma, A. Sabidussi, and H. Schenk (2007), *The role of innovation in merger policy: Europe's efficiency defence versus America's innovation markets approach.Two cases* , WP n. 07-21, T.C. Koopmans Institute, Utrecht School of Economics, Utrecht University, Utrecht.

- Brusoni S., E. Cefis, L. Orsenigo (2006), *Innovate or Die? A critical Review of the Literature on Innovation and Performance*, WP 179, CESPRI, Università Bocconi, Milano.

- Cefis, E. (1999), *Innovation and Industrial Dynamics: the Case of High Speed Trains in Italy,* Quaderni del Dipartimento di Scienze Economiche, No.15/1999, University of Bergamo, Bergamo.

- Cefis, E., and G. Espa (1998), *Assessing Accuracy in Transition Probability Matrices.* Discussion Paper No.1, Dipartimento di Economia, University of Trento, Trento.

- Cefis, E., and G. Espa (1997), *Modelli di interazione spaziale: presupposti teorici e aspetti applicativi*. Working Paper No.1997-05 del CEEL (Computable and Experimental Economics Laboratory), University of Trento, Trento.

- Carreras, A., and E. Cefis (1996), *The Development of Italian Highway Network 1924-1993. A Computerized Atlas*, European University Institute Working Paper HEC No. 96/1, Florence.

- Cefis, E. (1992), *Le transizioni da un paradigma tecnologico all'altro nel settore della trazione ferroviaria in Italia*, European University Institute, Florence.

Externally commissioned/sponsored research reports

★ Cefis, E. and P. Gritti (2009), Le esternalità delle spese in R&D: un'analisi empirica. In G. Graziola (ed.), *Prospettive ed effetti moltiplicativi degli investimenti nei settori ad alta tecnologia nelle economie avanzate. Con particolare riferimento al settore spaziale in Europa,* Department of Economics "Hyman P.Minsky", University of Bergamo, Bergamo (Research Report commissioned by Italian Space Agency – ASI), cap. 9, 269-319

★ Antonicelli, P., E. Cefis, M. Della Luca, E. Zaninotto (2002), *Politiche pubbliche per le imprese e dinamica industriale in Trentino*, (Research Report commissioned by Provincia di Trento), University of Trento, Trento.

★ Cefis, E., and G. Gorla (1996), *La ripartizione modale del traffico merci in Italia: un'analisi empirica*, In CESPRI - Centro Studi sui Processi di Internazionalizzazione, *Progetto Alta Velocità: gli effetti sul sistema economico*, (Research Report commissioned by FS - Ferrovie dello Stato), Bocconi University, Milan.

★ Cefis, E. (1994), *La deverticalizzazione delle FS e i rapporti tra committente e imprese.* In CESPRI - Centro Studi sui Processi di Internazionalizzazione, *Progetto Alta Velocità: gli effetti sul sistema economico*, (Research Report commissioned by FS - Ferrovie dello Stato), Bocconi University, Milan.

★ Cefis, E. (1993), *Gli effetti sul sistema industriale.* In CESPRI - Centro Studi sui Processi di Internazionalizzazione, *Progetto Alta Velocità: gli effetti sul sistema economico*, (Research Report commissioned by FS - Ferrovie dello Stato), Bocconi University, Milan.

Impact on Academia

Citations from 2002 till April 2016:

- **Web of Science** - ISI: **Total 434**; without self-citations 412**; h-index=9**
- **Scopus**: **Total 600;** without self-citations of all authors 528; **h-index=9**
- **Google Scholar**: **Total 1972**; **h-index=17; i10-index=24**

Organiser of the following Conferences

- **DIME-HIPO WORKSHOP:'INDUSTRIAL DYNAMICS AND ECONOMIC GEOGRAPHY'** (with R. Boschma, M. Capasso, K. Frenken, and E. Stam), Utrecht Urban and Regional research centre Utrecht (URU), Utrecht University, Utrecht, The Netherlands, 5-7 September 2010

- **COOPERATIVE CREDIT AND SOCIAL FINANCE DURING RECESSION PERIODS** (with M. Mazzoli), Università del Sacro Cuore di Mialno, Sede di Piacenza, Piacenza, Italy, 5 December 2008

- **REVOLVING DOORS: ENTREPRENEURIAL SURVIVAL AND EXIT** (with O. Marsili) Centre for Entrepreneurship and New Business Venturing, Rotterdam School of Management, Rotterdam, the Netherlands, 27-28 November 2008.

Invited presentations

November 2015:	**International Workshop**: **Innovation and Competitiveness in Europe**, Università Cattolica del Sacro Cuore, Piacenza
April 2008:	**Scuola Superiore Sant'Anna**, Pisa
February 2008:	**CESPRI**, Università Bocconi, Milan
January 2008:	**Max Plank Institute of Economics** and **University of Jena**, Jena, Germany
October 2007:	**Institute for Prospective Technological Studies (IPTS), JRC - European Commission**, Seville, Madrid
November 2005:	**CESPRI**, Università Bocconi, Milan
December 2003:	**T. Koopmans Institute**, Utrecht School of Economics, Utrecht University, Utrecht
April 2002:	**L.E.M.**, St. Anna School of Advanced Studies, Pisa
May 2001:	**BETA**, University of Strasbourg, Strasbourg, France.
May 2000:	École de Management (**E.M. LYON**), Lyon, France.

Conference Presentations

DRUID (Danish Research Unit for Industrial Dynamics) Summer Conference, Copenhagen, Denmark, June 2007; Rome, Italy, June 2015
ISS – International Schumpeter Society Conference, Manchester, UK, 2000; Milan, Italy, 2004; Nice, France, 2006; Jena, Germany, 2014
ENEF - European Network on the Economics of the Firm, Sant'Anna School of Advanced Studies, Pisa, Italy, 11 – 12 Sept. 2008; Manchester Institute of Innovation Research (MIOIR), Manchester Business School, U.K., 11-12 Sept. 2014
Dime-Hipo Workshop:'*Industrial Dynamics And Economic Geography'*, Utrecht Urban and Regional research centre Utrecht (URU), Utrecht University, Utrecht, The Netherlands, 5-7 September 2010
FIRB-RISC Conference 2009: *Research and entrepreneurship in the knowledge-based economy*,

KITeS-Cespri, Bocconi University, Milan, Italy, September 7-8

EMAEE (European Meeting on Applied Evolutionary Economics), Jena, Germany, 2009; Utrecht, The Netherlands, 2005.

Workshop: ***Revolving Doors: Entrepreneurial Survival and Exit*** , Centre for Entrepreneurship and New Business Venturing, Rotterdam School of Management, Rotterdam, the Netherlands, 27-28 November 2008

DIME workshop: *The dynamics of firm evolution: productivity, profitability and growth*, St. Anna School of Advanced Studies, Pisa, Italy, 3-4 October 2008.

ECEI 2007 - *2° European Conference in Entrepreneurship and Innovation*, Utrecht University, Utrecht, The Netherlands, 8-9 November 2007

CONCORD 2007 - 1° European Conference on Corporate R&D**,** *Knowledge for Growth: Role and Dynamics of Corporate R&D*, Seville, Spain, October 2007

DIME (Dynamics of Institutions and Markets in Europe – Network of Excellence) workshop, *Firm-Level Longitudinal Data on Economic Performances and their Determinants*, Volterra, Italy, 5-8 June 2006 **(invited)**

Max-Planck Institute of Economics conference, *Firm Exit and Serial Entrepreneurship*, Jena, Germany, January 2006 **(invited)**

EARIE (European Association for Research in Industrial Economics) Conferences**,** Vienna 1996, Torino 1999, Madrid 2002, Berlino 2004, Porto 2005, Amsterdam 2006.

Business Performance in the 20th century: A comparative Perspective, Bocconi University, Milan, 14-16 October 2004 **(invited)**

Conference in Honor of Keith Pavitt, *What do we Know about Innovation?,* SPRU, Brighton, UK, 2003

The Open University Conference, *Innovation, Growth and Market Structure: Biotechnology & Pharmaceuticals,* London, 2003 (invited)

EUNIP (European Network of Industrial Policy) Conference, Turku, Finland, 2002; e Porto, Portugal, 2003

University of Bologna Conference, *The Post-entry Performance of Firms: Technology, Growth, and Survival***,** Bologna, 2002 (invited)

ZEW Conference, *The Economics of Entrepreneurship and the Demography of Firms and Industries,* Mannheim, 2002 (invited)

L.E.M. Conference, *International Workshop on Industrial Dynamics*, St. Anna School of Advanced Studies, Pisa, 2002 (invited)

ECIS (Eindhoven Centre for Innovation Studies) Conference, *The Future of Innovation Studies,* Eindhoven, The Netherlands, 2001

Nelson and Winter Conference, DRUID (Danish Research Unit for Industrial Dynamics), Aalborg, Denmark, 2001

Applied Evolutionary Economics Conference, Grenoble 1999

The Economics of Science and Technology: micro-fundations and policy, Urbino, Italy, 1998

ESEM (European Society Econometric Meeting) Conferences, Istambul 1996; Santiago de Compostela 1999

EEA (European Economic Association) Conference, Istambul 1996

RES (Royal Economic Society) Conference, Swansee, UK, 1996

Teaching

Doctoral Students

Damiana Rigamonti: *Industry Relatedness in M&A. An empirical analysis on acquisitions, innovation and Leverage Buy-Outs (LBO)*, University of Bergamo, Bergamo (2009–2012).

Lesley Potters (co- supervisor with Prof. Hans Schenk): *The factors that influence innovation and the impact on business performance in low R&D intensive sectors in Europe*, Utrecht University, Utrecht, The Netherlands (2005-2015, but not yet presented)

Teaching experience

Academic years 2011/12 and 2012/13: on leave for family reasons.

Ph.D. and Master [Two-year second level degrees] level:

a.y. 2014/15: Lecturer in **Industrial Organization and Market Failures** (lectured in English – EN); Ph.D. program "International Doctoral Program in Economics", program jointly offered by the Institute of Economics of the St. Anna School of Advanced Studies and by the Université de Strasbourg, Scuola Superiore Sant'Anna, Pisa (10 students);

a.y. 2013/14 and 2015/16: Lecturer in **Economics of Innovation** (lectured in English – EN); Ph.D. program "Doctoral Research in Economics and Management of Technology" (DREAMT), Department of Economics and Management of the University of Pavia (20 students);

a.y. 2015/16 : Lecturer in **Innovation and Industries' Evolution** (lectured in English – EN); Two-year second level Master program, University of Bergamo (20 students),

a.y. 2013/14 and 14/15: Lecturer in **Industrial Dynamics and Innovation** (lectured in English – EN); Two-year second level Master program, University of Bergamo (15-20 students),

a.y. 2010/11: Lecturer in **Industrial Dynamics and Technological Innovation** (lectured in English – EN); Two-year second level Master program, University of Bergamo (50-60 students)

from 2001 till 2006 (excluding 2004) (tot. 5 years): Tutor of **Econometrics** (IT) at the Summer School for Ph.D. students organized by CIDE at Bertinoro, University of Bologna. (55-60 students)

Bachelor level:

a.y. 2014/15 - present: Lecturer in **Economics of the firm** (lectured in Italian – IT), University of Bergamo (300 students)

a.y. 2013/14 - present: Lecturer in **Economics of Innovation** (IT), University of Bergamo (50 students)

a.y. 2006/7 – 2007/8: Lecturer in **Theory of the Firm** (IT), University of Bergamo (20 - 30 students)

a.y. 2007/8 and 2010/2011: Lecturer in **The Italian Economy in the European Context** (lectured in English – EN), University of Bergamo (20 studenti)

a.y. 2008/9: Lecturer in **Advanced Macroeconomics** (IT) (last 3 cfu of a 9cfu course), University of Bergamo (20-30 students)

a.y. 2006/7 – 2007/8 and 2010/2011: Lecturer in **Advanced Macroeconomics** (IT), University of Bergamo (30-40 students)

a.y. 2006/7: Lecturer in Economics (**Microeconomics)** (IT), University of Bergamo (150-200 students)

a.y. 2004/5 and 2005/6: Lecturer in **Market organisation, dynamics and innovation** (EN), Utrecht School of Economics, Utrecht University (150 students)

a.y. 2003/4 : Lecturer in **Market Organisation and Regulation** (EN), Utrecht School of Economics, Utrecht University (120 students)

a.y. 2001/2 – 2002/3: Lecturer in Economics (**Microeconomics)** (IT), University of Bergamo (250-300 students)

a.y. 2001/2 – 2002/3: Lecturer in **Industrial Dynamics** (IT), University of Bergamo (30-40 students)

from a.y.1997/1998 till a.y. 2000/1 (4 years): Lecturer in **Economic History** (IT), University of Bergamo (450 students)

a.y.1998/9 and 2000/1: Visiting lecturer in **Economic Policy** (IT), Bocconi University, Milan (150 students)

a.y. 1998/9: Visiting lecturer in **Econometrics** (lectured in Spanish), Pompeu Fabra University, Barcelona, Spain (2 courses; 120 students)

a.y. 1993/4: Teaching assistant of **Statistics**, Faculty of Economics, University of Sassari.

Administrative Experience

2015 – present: **Responsible** for the **stages at ISTAT** for the two-year Master programs of the Dep. of Management, Economics and Quantitative Methods, University of Bergamo

2014 – 2018: **Member of the Commission for the Technological Transfer** of the University of Bergamo

2016 : **Responsible for the SuaRd 2015** inside the Commission for Research Activities, University of Bergamo

2015 – 2017: **Member of the Commission for Research Activities** of the Dep. of Management, Economics and Quantitative Methods, University of Bergamo

2015: **Member of the Commission** to assign the "**5 per mille" premium** to two assistant professors of the Dep. of Management, Economics and Quantitative Methods, University of Bergamo

a.y. 2014 -15: **Co-Responsible**, with prof. A. Cristini, for the **Internationalisation of the two-year Master program Economics and Global Markets**

2010: **Member of the Commission** for the **reform of the programmes** of the three-year first level degrees (Laurea Triennale) and the two-year second level degrees (Laurea Specialistica) of the Faculty of Economics , University of Bergamo

2009 – 2011: **Coordinator** with Prof. G. Maurini three-year first level degree courses (Laurea Triennale) in Corporate Economics (Treviglio)

2010 **Member of the Commission** to examine the applications and do the interviews at the applicants to the two-year second level degree in Business Economics and Innovation in the International Markets for the academic year 2010/2011 (EIMI - classe 56):

2007 – 2009: **Delegate of the Rector** of Bergamo University for the relationships between the detached branch of Bergamo University in Treviglio and the City Hall of

Treviglio.

2006 – 2008: **Organiser** of the "**Seminar Series**" of the **Department of Economics**, University of Bergamo

2006: Member of the commission for the **University Competition for an Assistant Professor position** (Membro della Commissione per la valutazione comparativa ad un posto di Ricercatore universitario) at **University of Bologna, Economics Faculty** (Sede di Forlì; SSD SECS-P/02 - Politica Economica) in **Economic Policy** (data di nomina: 27/02/2006, gazz. Uff. nº 22, 21/03/2006)

2005 – 2006: **Co-organiser** of the "**External Seminar Series**" of the **T. Koopmans Institute,** Utrecht School of Economics, Utrecht University

2005 – 2006: Member of the commission for the organization and the management of the "**honours programme**" (bachelor programme specific for the best students of the Economics Faculty) of the Utrecht School of Economics, Utrecht University

2005 – 2006: Member of the commission for the organization of the **Utrecht School of Economics - LUISS Bachelor's Degree Course in Business and Economics,** international bachelor programme jointly organised by Utrecht School of Economics, Utrecht University and LUISS University, Rome

2001 – 2004: **Managing Editor** of the (refereed) Discussion Papers Series of the Economics Department, *Quaderni del Dipartimento di Scienze Economiche*

2002 – 2003: in charge of **Student Counselling** for the Faculty of Economics, University of Bergamo.