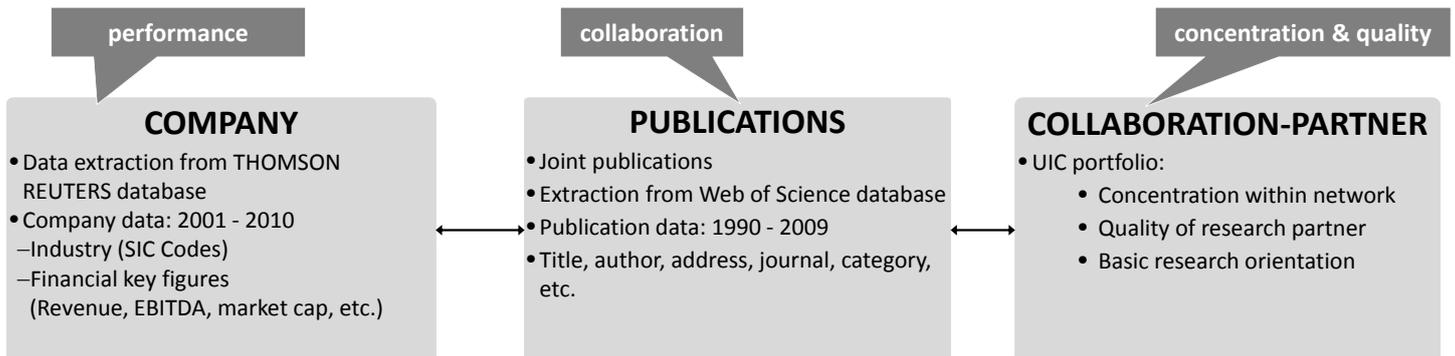# Performance Effects of University-Industry-Collaboration (UIC)

MAIN RESEARCH QUESTIONS
Does UIC have a positive effect on firm performance?
Does this effect manifest itself with a certain time lag?

ABSTRACT
Does university industry collaboration (UIC) have a positive effect on a firm's performance, and does this effect manifest itself with a certain time lag? This issue is currently unacknowledged, although UIC and its impact on innovation and on patent behavior have been of wide interest in past research. However, there is only limited evidence regarding the long-term effects of UIC. The few studies that have investigated its impact on firm performance had mixed results. Moreover, most studies focus on single industries and certain regions, and neglect the time lag between UIC and its manifestation in potential successful new products. With this study, we aim to investigate the effect of UIC on firm performance using a longitudinal analysis of joint publications and capital-market-based firm performance. We use bibliometric data derived from an extensive analysis of jointly authored publications of 95 large companies to determine UIC and relevant characteristics of the involved universities, the research orientation of the collaboration projects, and the alliance portfolio of the firm. We show that UIC reveals its maximum positive effect on firm performance with a time lag of four years. Furthermore, we explore potential moderators: UIC has a stronger performance impact when firms concentrate on a limited number of partners and when they collaborate with high-quality universities. However, the performance impact is weaker when a greater orientation towards basic research exists.

performance

collaboration

concentration & quality

COMPANY
- Data extraction from THOMSON REUTERS database
- Company data: 2001 - 2010
  - Industry (SIC Codes)
  - Financial key figures (Revenue, EBITDA, market cap, etc.)

PUBLICATIONS
- Joint publications
- Extraction from Web of Science database
- Publication data: 1990 - 2009
- Title, author, address, journal, category, etc.

COLLABORATION-PARTNER
- UIC portfolio:
  - Concentration within network
  - Quality of research partner
  - Basic research orientation

RESULTS

Table 1: Long-term effects of collaboration intensity on firm performance

	Firm performance	
	Model 1	
Collaboration Intensity		
Lagged (t =-1)	-4.14†	(2.17)
Lagged (t =-2)	2.58*	(1.10)
Lagged (t =-3)	5.15**	(.88)
Lagged (t =-4)	10.23**	(.85)
Lagged (t =-5)	1.61†	(.85)
Lagged (t =-6)	1.11	(.81)
Time		
2002	-.43**	(.09)
2003	-.19†	(.09)
2004	-.12	(.09)
2005	-.19†	(.09)
2006	-.24*	(.09)
2007	-.23*	(.09)
2008	-.80**	(.09)
2009	-.59**	(.09)
2010	-.53**	(.09)
R^2 within	.34	
R^2 between	.34	
R^2 overall	.28	
F	28.74**	

Fixed-effects regression; unstandardized coefficients with std. errors in parenthesis; † = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; n = 95.

Table 2: Moderating effects enhancing firm performance

	Firm Performance									
	Model 1		Model 2		Model 3		Model 4		Model 5	
Direct effects (time lag t= -4)										
Collaboration Intensity[a]	11.68**	(.72)	-17.03**	(5.24)	5.30**	(1.42)	14.96**	(1.79)	-6.60	(6.95)
Partner Quality[a]	.06	(.14)	-.07	(.14)	.08	(.14)	.05	(.14)	-.03	(.14)
Partner Concentration[a]	.21	(.13)	.13	(.13)	.07	(.13)	.20	(.13)	.08	(.13)
Basic Research Orientation[a]	.01	(.02)	.01	(.02)	.01	(.02)	.02	(.02)	.02	(.02)
Interaction effects (time lag t= -4)										
Partner Quality[a]			31.91**	(5.77)					21.17*	(8.96)
Partner Concentration[a]					19.58**	(3.79)			9.79†	(5.88)
Basic Research Orientation[a]							-1.82*	(.91)	-2.20*	(.89)
Time										
2002	-.35**	(.10)	-.33**	(.10)	-.35**	(.10)	-.35**	(.10)	-.34**	(.10)
2003	-.08	(.10)	-.07	(.10)	-.06	(.10)	-.08	(.10)	-.06	(.10)
2004	-.05	(.10)	-.06	(.10)	-.07	(.10)	-.06	(.10)	-.07	(.10)
2005	-.06	(.10)	-.06	(.10)	-.06	(.10)	-.05	(.10)	-.05	(.10)
2006	-.13	(.10)	-.09	(.09)	-.09	(.10)	-.13	(.10)	-.09	(.09)
2007	-.06	(.10)	-.03	(.10)	-.06	(.10)	-.06	(.10)	-.04	(.09)
2008	-.62**	(.10)	-.61**	(.09)	-.61**	(.09)	-.63**	(.10)	-.61**	(.09)
2009	-.47**	(.10)	-.46**	(.10)	-.46**	(.10)	-.47**	(.10)	-.45**	(.09)
2010	-.49**	(.10)	-.47**	(.10)	-.47**	(.10)	-.48**	(.10)	-.46**	(.10)
R^2 within	.38		.41		.40		.38		.41	
R^2 between	.39		.41		.39		.39		.38	
R^2 overall	.33		.33		.34		.32		.33	
F	29.87**		31.20**		30.76**		28.15**		28.08**	

Fixed-effects regression; unstandardized coefficients with std. errors in parenthesis. [a]= lagged variables (t= -4). † = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; n = 95.

Project partners:

TU Berlin

DTU — Technical University of Denmark

Alexander N.P. Wirsich
wirsich@bwl.uni-kiel.de
+49 431 880-4740