产学研协同创新对区域创新绩效影响研究

2003−2012 26 DEA

GMM

210046

210046

200125

2010 Gao et al.,2011

R&D (

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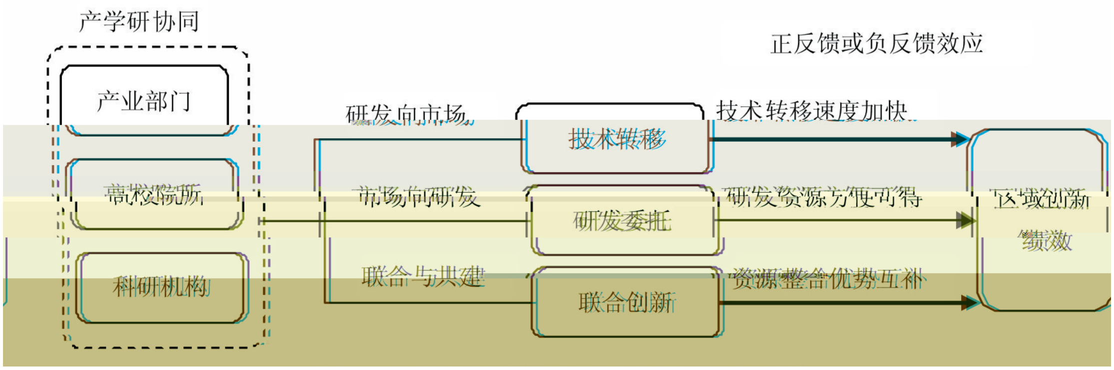
Grimaldi et al.,2002 Perkmann et al.,2011
Gao et al.,2010
Carayannis 2000 Perkmann et al.,2007 Santoro
et al.,2001 Pablo and Perkmann 2011
2010 2013
2007 Seppo et al.,2012 2008
2009
2012 Carayanniset a1.,2000
Koschatzky 2002

GMM

1



1

Chensbrough 2003 Etzkowita 2008

DEA

DEA

DEA Charnes and Cooper. 1978 TE PTE

SE C2R

Banker et al. 1984

BC2

DEA $IPF_i=\alpha+\beta_1 RDK_i+\beta_2 HUM_i+\beta_3 RDK^2_i+\beta_4 HUM^2_i+\beta_5 RDK_i HUM_i+\varepsilon_i$

BC2 DEA DEA

2

CO_{it}

2 DEA

	R&D R&D	R&D

2012

3

$CO=\{I,U,R\}=\{\mu_1(e_{ji}),\ \mu_2(e_{ji}),\ \mu_3(e_{ji})\}$ I,U,R

$e_j=(e_{j1}\ e_{j2}\ \ e_{jn})$ $n\geq1$ e_{ji} $[\beta_{ji}\ \ \alpha_{ji}]$ $i=1$ 2 n β_{ji} α_{ji} $(e_{j1}\ e_{j2}$ $e_{jm})$ $(e_{jm+1}\ e_{j2}\ \ e_{jn})$

3

		R&D
		R&D

$$\mu_j(e_{ji})=\begin{cases}\dfrac{e_{ji}-\beta_{ji}}{\alpha_{ji}-e_{ji}} & i\ \ [1,m]\\[2ex] \dfrac{\alpha_{ji}-e_{ji}}{\alpha_{ji}-\beta_{ji}} & i\ \ [m+1,n]\end{cases}$$

$\mu_j(e_{ji})$ $[0,1]$ I,U,R

0 1

$\sqrt[n]{\Pi_1^n \frac{1}{n}\mu_j(e_{ji})}$

, $CO=\{I,U,R\}$ $CO^i=\sqrt[3]{|I^{i+1}-I^i|\times|U^{i+1}-U^i|\times|R^{i+1}-R^i|}$

HUM GDP RDK HUM

Barro and Lee(1993) RDK 2003

2011 9.6%

2003-2012 26

WIND

1\.

R&D R&D

DEAP2.1

2\.

2004 2012

4

Dickey-Fuller ADF

5

4

	2004	2005	2006	2007	2008	2009	2010	2011	2012
	0.881	1.01	1.142	1.158	1.187	1.236	1.388	1.083	1.133
	0.958	0.953	1.202	1.103	1.133	1.01	1.247	1.04	1.146
	0.813	0.855	0.961	1.22	1.027	1.003	1.255	0.958	1.213
	0.796	0.763	0.867	1.046	0.934	1.147	1.141	0.858	1.233
	0.853	0.801	0.853	0.899	0.906	0.905	0.721	0.965	0.921
	0.905	0.962	1.202	1.126	1.139	1.251	1.104	1.223	1.004
	1.083	0.827	1.037	1.11	1.059	0.891	1.127	1.068	1.053
	1.041	1.022	1.114	1.002	0.933	0.889	1.026	1.335	1.205
	0.819	1.015	1.042	1.316	1.046	1.019	1.228	1.001	1.107
	1.099	0.939	1.239	1.367	1.171	1.295	1.312	1.296	1.141

5

	2004	2005	2006	2007	2008	2009	2010	2011	2012
	0.0000	0.0749	0.0693	0.0841	0.1024	0.0928	0.1177	0.0990	0.1666
	0.1988	0.0274	0.0269	0.0695	0.1555	0.1134	0.0774	0.1599	0.1979
	0.0000	0.1486	0.1332	0.1467	0.1059	0.2515	0.2157	0.0661	0.1498
	0.0000	0.0882	0.0820	0.0799	0.1142	0.4264	0.0900	0.2116	0.0976
	0.1801	0.0420	0.0682	0.0529	0.2915	0.1987	0.0321	0.0525	0.1406
	0.1306	0.1115	0.1078	0.0184	0.1316	0.2095	0.0857	0.1630	0.1145
	0.1843	0.0743	0.0738	0.1411	0.0781	0.0273	0.0940	0.0340	0.0669
	0.0000	0.1514	0.1385	0.1458	0.1216	0.0331	0.1189	0.0409	0.0300
	0.0000	0.0536	0.0533	0.1455	0.1033	0.0884	0.0706	0.1072	0.2103
	0.0000	0.0850	0.0837	0.1242	0.0901	0.1037	0.0777	0.1680	0.1295

3\.

Stata12

Likelihood Ratio

Hausman

GMM

26

6

6 ADF

	ADF	(C,T,P)	P	
IPF	68.3392	(C,0,1)	0.0407**	
CO	89.1139	(C,0,1)	0.0032***	
IPF^{-1}	66.5444	(C,0,1)	0.0393**	
HUM	208.836	(C,T,1)	0.0029***	
GDP	176.274	(C,T,1)	0.0000***	
RDK	101.682	(C,0,1)	0.0002***	

$^{***}p<0.01$ $^{**}p<0.05$ $^{*}p<0.1$ ADF C, T,P C T P AIC

7

	FE	RE	OLS			
IPF^{-1}			0.500^{***}	1.004^{***}	1.026^{***}	0.768^{***}
			−11.41	−29.88	−41.02	−11.04
CO	0.318	0.303	0.131	0.131^{**}	0.288^{***}	0.131
	−0.71	−0.64	−0.27	−2.2	−3.92	−1.31
CO^{-1}	−0.029	−0.093	0.161	-0.196^{***}	0.327^{***}	−0.237
	(−0.07)	(−0.21)	−0.34	(−3.22)	−3.14	(−0.85)
RDK	0.01	0.693^{***}	0.404^{***}	0.193^{***}	0.189^{**}	0.321^{*}
	−0.03	−3.65	−5.03	−4.04	−2.04	−1.76
HUM	2.188^{***}	0.04	0.158^{*}	-0.426^{***}	0.679^{***}	-0.359^{*}
	−3.03	−0.19	−1.81	(−5.27)	−4.8	(−1.72)
GDP	0.63	−0.476	-0.424^{***}	-0.221^{**}	-0.272^{*}	−0.415
	−0.98	(−1.36)	(−2.80)	(−2.33)	(−1.74)	(−1.41)
C	-21.133^{***}	-5.310^{***}	-2.906^{***}	2.246^{***}	-5.626^{***}	1.663
	(−4.64)	(−4.11)	(−5.45)	−3.73	(−5.98)	−0.66
BP test	0.0000	0.0000	0.0000			
Hausman	0.0003	0.0003	0.0003			
Adjusted R^2	0.292		0.604			
Sargan test				0.2703	0.4378	0.9929
Bond test AR(1)				0.0601	0.0761	0.1341
AR(2)				0.2305	0.4346	0.3392

$^{***}p<0.01$ $^{**}p<0.05$ $^{*}p<0.1$ t

GMM Sargan test GMM

Arellano-Bond test

L L+1 7

Sargan test 0.2703 0.4378 Bond test AR(1) AR(2) GMM Sargan test 0.9929 1 Bond test GMM GMM

1.026 1.004 0.768

0.131 0.288 2

-0.196 0.327

1 R&D GDP
2.6%
2.5% R&D

2

GDP

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