



*Research article*

## **Intellectual capital and high-tech firms' financing choices in the European context: a panel data analysis**

**Filipe Sardo<sup>1,2,\*</sup> and Zélia Serrasqueiro<sup>3</sup>**

<sup>1</sup> ISCA-UA, University of Aveiro, The Research Unit on Governance, Competitiveness and Public Policies (GOVCOPP), Aveiro, Portugal

<sup>2</sup> Universidade Portucalense, Porto, Portugal

<sup>3</sup> Department of Management and Economics, University of Beira Interior, CEFAGE-UBI—The Centre for Advanced Studies in Management and Economics of the University of Beira Interior Covilhã, Portugal

\* **Correspondence:** Email: [fsardo@ua.pt](mailto:fsardo@ua.pt).

---

## **Supplementary**

### **Appendix A**

**Table A1.** Estimation results—Investment in Intangible Assets.

Independent Variables	Dependent Variable: $InvIntangible_{i,t}$			
	Pooled OLS	RE	FE	GMM system (1998)
$InvIntangible_{i,t-1}$				0.03595*** (0.01908)
$CF_{i,t-1}$	0.02747 (0.03515)	0.04467 (0.03798)	0.11048** (0.05518)	0.16241*** (0.07040)
$TDEBT_{i,t-1}$	-0.00864 (0.02948)	-0.02964 (0.03443)	-0.20758*** (0.06766)	-0.29034*** (0.15869)
$EqIssue_{i,t-1}$	0.01049 (0.04370)	0.01576 (0.04483)	0.01253 (0.05131)	0.26041*** (0.11672)
$OWNCONC_{i,t-1}$	-0.00045** (0.00020)	-0.00048** (0.00023)	-0.00113** (0.00046)	-0.00541*** (0.00103)
$SIZE_{i,t-1}$	-0.00176 (0.00255)	-0.00168 (0.00311)	-0.01797 (0.01887)	0.03711*** (0.01159)
$AGE_{i,t-1}$	0.00375 (0.00509)	0.00094 (0.00626)	-0.21111*** (0.03855)	-0.32936*** (0.05288)
$Dcrisis_{08,09}$	0.08761*** (0.01124)	0.08899*** (0.01102)	0.06507*** (0.01259)	0.05533*** (0.01311)
CONS	0.01356 (0.03314)	0.02336 (0.04030)	0.99946*** (0.24892)	0.61524*** (0.11332)
Observations	4,974	4,974	4,974	4,014
Firms	752	752	752	715
LM ( $\chi^2$ )		28.89***		
Hausman ( $\chi^2$ )		58.99***		
$R^2$	0.01354	0.0133	0.02950	
Wald ( $\chi^2$ )		73.27***		
$F(N(0,1))$	9.740***		18.31***	14.67***
Hansen ( $\chi^2$ )				141.8
$m1(N(0,1))$				-9.061***
$m2(N(0,1))$				0.106

Notes: Intellectual Capital investment (VAIC<sub>(i,t)</sub>) Cash Flow [(CF)<sub>(i,t)</sub>] Total Debt [(TDEBT)<sub>(i,t)</sub>] Equity issue (EqIssue<sub>(i,t)</sub>) Ownership concentration [(OWNCONC)<sub>(i,t)</sub>] Size [(SIZE)<sub>(i,t)</sub>] [Age (AGE)<sub>(i,t)</sub>] Financial Crisis (Dcrisis<sub>(08;09)</sub>)1. CONS is the constant of the regressions. 2. Standard errors in parentheses. 3. \*\*\*significant at 1% level and \*\*significant at 5% level.



AIMS Press

© 2021 the Author(s), licensee AIMS Press. This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>)