The CSP-CFP missing link: complementarity between ESG practices?

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OVERVIEW OF THE PRESENTATION

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1. LITERATURE REVIEW
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4. SUMMARY AND CONCLUSION

The CSP-CFP 'missing' link: complementarity between ESG practices ?

- *Puzzling fact*: no consensus on the relationship between corporate social performance (CSP) and corporate financial performance (CFP)
- *Research question*: is there a missing link between ESG practices that explain firm performance ?
- *Methodology* : Econometric study on matched ESG ratings from the Vigeo database and economic and financial performance data

Literature review

THE CSP-CFP RELATIONSHIP: WHERE DO WE STAND ?

SOME METHODOLOGICAL PROBLEMS

Literature review

o The CSP-CFP relationship

The empirical link between corporate social performance and corporate financial performance has received considerable attention for three decades

The CSP-CFP relationship

o Examples of surveys 10 years ago

Authors	Methodology	Period	Results
Roman, Hayibor & Agle, (1999)	Survey of 57 studies		positive: 33 negative: 5 neutral: 14
Griffin & Mahon (1997)	62 studies since1970	1970-1999	positive: 51 negative: 20 Neutral: 9
Pava & Krausz (1996)	21 studies since 1970		positive: 12 negative: 1 neutral: 8

The CSP-CFP relationship

o Some recent surveys

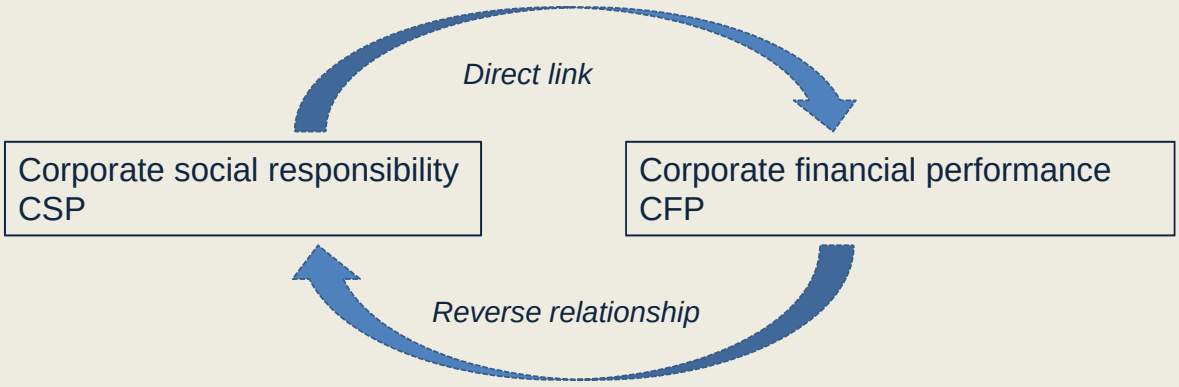
Authors	Methodology	Period	Results
Margolis, Elfenbein &Walsh (2007)	meta-analysis of 167 studies	1972-2007	Weak positive effect Causality: CFP -> CSP
Margolis & Walsh (2003)	Survey of127 studies since1970	1972-2000	From CSP to CFP Positive: 54 Non significant: 28 Negative: 7 Mixed: 20
			From CFP to CSP Positive: 16 Non significant 3 Mixed: 3
UNEP-Fi et Mercer (2007)	20 studies published in the early 2000s	1972-2004	Positive: 10 Negative: 4 Neutral or non monotonous: 6
Orlitsky et al. (2003)	Compilation of 52 studies		Positive: 27 Negative: 2 Neutral: 23

Positive : 31	*Negative : 14*	*Neutral, non significant, mixed or non monotonous : 31*
von Arx U. et Ziegler A. (2008). Abramson et Chung. (2000) Berman et al . (1999) Christmann (2000) Cremers et Nair (2005) Cullis et al, (1992) Derwall et al. (2005) Dowell et al. (2000) Ferell et Maignan (2004) Gompers et al, (2003) Graves et Waddock (1994) Graves et Waddock (2000) Hillman et Keim (2001) Johnson and Greening (1999) Jones et Murrell (2001) Konar, et Cohen (2001) Little et Little (2000) Mallin et al. (1995) Opler et Sokobin (1995) Orlitzky et al, (2003) Rivoli (2003) Ruf et al. (2001) Salama (2005) Shank et al,(2005) Simpson et Kohers (2002) Smith (1996) Statman (2000) Statman (2006) Tsoutsoura (2004) Van de Velde et al. (2005) Waddock et Graves (1997)	Ali et Gold (2002) Brammer et al. (2006) Carswell (2002) Chong et al. (2006) Coleman. (2008) Garcia-Castro et al. (2007) Geczy et al. (2005) Girard, Stone et Rahman (2007) Hickman (1999) Hoggett et Nahan (2002) Hong et Kacperczyk (2006) Moon (2007) Renneboog et al. (2005) Stone (2001)	d'Arcimoles et Trebucq (2003) Arbelaez et al. (2006) Barnett et Salomon (2006) Bauer, Derwall et Otten (2007) Bauer, Otten et Rad (2006). Bello (2005) Benson et al. (2006) Boatright (1999) Carhart (1997) Core et al. (2006) DiBartolomeo, Dan et Kurtz (2000) Garcia-Castro, Arino et Canela (2007) Guerard (1997a et b) Hill, Ainscough, Shank et Manullang (2007) Hoggett et Nahan (2002) Kreander et al. (2005) Luck et Pilotte (1993) McWilliams et Siegel (2000) Post, Preston et Sachs (2002) Lankoski (2007) Morrison-Paul et al. (2006) Minor (2007) Paton et Elsayed (2005) Sauer (1997) Schröder (2004) Shadbegian et Gray (2005) Statman (2000) Stone et al. (2001) Vitaliano et Stella (2004) Waddock et Graves (2000) McWilliams et Siegel (2000)

The CSP-CFP relationship

o Absence of consensus

No conventional wisdom in the literature on whether CSP leads (or not) to superior CFP, or whether CFP is necessary for CSP.



The CSP-CFP relationship

o Absence of consensus

Recent research points at numerous biases and problems of previous work

1. Problems of measurement of CSP

Disclosure of pollution control , environmental practices , social performance .. Expenditures on environmental practices . Fortune reputation rating . Ratings of charity, community relations, customer relations, environmental practices, human resource practices. Observations of charitable contributions, consumer protection, disclosure, equal employment opportunity, hr practices. Mutual fund screens. Timing and intensity of pollution-reducing technologies Survey on environmental practices , minority hiring and training, ecology, contributions to education and art . Waste prevention practices etc...

2. Wide diversity of measures used to assess financial performance

- Accounting based vs market based measured ; Short run vs long run measures etc...

The CSP-CFP relationship

o Biases and problems

3. Limited data

- very small samples , not representative
- old periods (concern over CSP still in infancy)
- cross-sectional or pooled data sets

cross-sectional analysis likely to be invalid in the presence of firm heterogeneity
panel data allows control for unobservable firm-specific effects

The CSP-CFP relationship

o Biases and problems

4. Model misspecification and endogeneity

- **Endogeneity** of profitability and performance

  a variable is endogenous when it is predicted by other variables than those in the model.

Sources : omitted variables , measurement errors , simultaneity (co-determined variables)

e.g. omitting to control for R&D investment or firm size when explaining CFP leads to misspecification and endogeneity

Consequences :

- In an econometrics regression, the independent variable will be correlated with the error term and the regression coefficient in an OLS regression will be biased.
- problems with the direction and mechanisms of causation

Interpreting the absence of consensus

- No consensus on the CSP-CFP link: is there a 'missing' link between CSP and CFP?

If there is no consensus on the link between CSR and CFP, this may suggest that it is a specific combination of firm policies that lead to superior performance.

Intuition: the complementarity between innovative HRM practices and computerization both in Europe and the US over the past decades, based on the following stylized facts (see e.g. Ichniowski and Shaw 2003; Boucekkine and Crifo, 2008):

- Firms have increasingly resorted to computerization
- Solow Paradox: "we can see the computer age everywhere but in the productivity statistics" (Solow, 1987)
- One explanation: only those firms that have adopted complementary innovative HR practices (teamwork, multi-tasking, quality circles etc.), skill accumulation and computerization have enjoyed superior performance

Interpreting the absence of consensus

- Is there a 'missing' link between CSP and CFP?

The complementarity between innovative HRM practices, skill accumulation computerization

TABLE 1. Computer use and multitasking by education level in French manufacturing, 1991 and 1998 (mean percentage)

	Computer use		Multitasking	
	1991	1998	1991	1998
Education level				
Primary	2.49	6.82	14.23	12.06
Lower secondary	2.56	4.72	4.06	4.11
Upper secondary, vocational/technical	4.61	16.73	14.72	18.28
Upper secondary	3.91	12.60	6.96	7.98
Tertiary	2.50	11.87	4.66	7.06
Post-tertiary, university	2.08	12.73	4.04	5.84
Total	18.14	65.47	48.67	55.33
Number of workers	20028	10369	20257	21374

Source: INSEE and DARES, Survey on Working Condition and Employment 1991, 1998.

From Boucekkine and Crifo (2008)

Methodology and assumptions

Methodology and assumptions

o Correlation between ESG scores

=> Does the complementarity between specific ESG policies leads to superior CFP ?

- The distribution of correlation among ESG scores from the Vigeo's database shows strong positive correlations between ESG policies (e.g. HR and HRts; HR and ENV; CS and Cin)

- This pattern is consistent with the idea that ESG practices are complementary

o Defining complementarity

Two or more practices are complements when using one more intensely, increases the marginal benefit of using others more intensively

(Milgrom & Roberts, 1990, 1995; Holmstrom & Milgrom, 1994)

Equivalently: a group of CSP factors is complementary if doing more of any subset of them increases the returns from doing more of any subset of the remaining factors

"the whole is more than the sum of its parts"

o Defining complementarity

- From a theoretical perspective:

complementarity means that the marginal returns to one variable increases in the level of any other variable

cross-partial derivatives of the payoff function are positive

technology is 'supermodular'

in game theory, supermodularity is the basic property underlying multiple equilibria in coordination games

may lead to a sub optimal outcome

Methodology and assumptions

o Empirical strategy: assumptions

Assumption 1: complementarity between ESG policies

Particular combinations of firm policies are complementary (ESG policies, HRM practices, size, R&D etc.)

Necessity to include as many control variable as possible (avoid endogeneity)

Assumption 2: complementarity may manifests itself over time

The link between CSP and CFP is not monotonous, it can be negative (e.g. in the short run) and/or positive (e.g. in the long run)

Necessity to conduct a dynamic analysis

Methodology and assumptions

o Empirical strategy: database

Measurement of CSP

Database: VIGEO

Ratings on environmental, social and governance factors

1997-2007, 18 countries, 618 firms - 2252 observations, 595 firms without US and Japan

CSP variables

- Scores per domain

Human rights	Environment
Human resources	Clients and suppliers (business behaviour)
Corporate governance	Community involvement

o Empirical strategy: database

Measurement of CFP

Database: ORBIS (Bureau Van Dijk)
Consolidated accounts (Financial profile, P&L accounts, financial ratios etc…)
1994-2008, 18 countries, 618 firms , 5629 observations

CFP variables and other characteristics

ROA (return on assets)	ROCE (return on capital employed)
ROS (return on sales)	Tobin's q = market or firm value / total assets
Firm size (employees, sales)	R&D expenditures
Risk (debt/assets) leverage	Solvency ratio
Market structure (concentration)	

o Empirical strategy: database

Merging Vigeo and Orbis

Method

- Gathering data from Orbis for each firm of the Vigeo database individually
- Retreating variables
- Unbalanced panel sample (heteroegenous years, missing data …)
- Final sample: 1787 observations

More than 1 year of work

Preliminary results

VERY PRELIMINARY, VERY INDICATIVE RESULTS

ROBUSTNESS TESTS IN PROGRESS

Preliminary results

- Econometrics model (1):

Linear regression model

$$Y_{it} = \alpha + \delta Y_{it-1} + \beta_1 CSP_{it} + \beta_2 X_{it} + \gamma_i + \varepsilon_{it}$$

where

Y= CFP variable

X= firm characteristics (size, industry, country, productivity…)

CSP= ESG scores

o Econometrics model (2): Panel data analysis

2 types of models:

- Random effects models

Allow accounting for individual heterogeneity with random effects across time or firms

$$Y_{i,t} = \alpha + \beta_1 CSP_{i,t} + \beta_2 X_{i,t} + \gamma_i + \varepsilon_{i,t}$$

o Econometrics model (2): Panel data analysis

- GMM models (generalized method of moments, see Blundell et al. 1998)

Allow accounting for lagged effects (for instance past performance) and endogeneity

$$Y_{i,t} = \beta_1 Y_{i,t-1} + \beta_2 Y_{i,t-2} + \beta_3 CSP_{i,t} + \beta_4 X_{i,t} + \gamma_i + \varepsilon_{i,t}$$

The GMM allows treating two important pb in econometric regressions:

- the CSR scores are supposed to be endogenous. Since we measure CFP and CSP both at the firm level, it is very likely that these variables are chosen simultaneously.

Because causality may run in both directions CSP ⇄ CFP
=> these variables may be correlated with the error term.

-the presence of the two lagged values of the dependent variable may give rise to autocorrelation

Preliminary results

Test 1: Marginal impact of HR and ENV score (short term)

Random effect GLS regression

=> HR and ENV scores have a negative impact in the short run on ROA

=> CGOV score has a positive impact on ROA (persists in combination with other scores)
CIN and CS are not significant

⇔ Short run cost of HR and ENV, short run benefit of CGOV ?

Preliminary results

Test 2: Marginal impact of ESG score (long term), endogeneity not accounted for

Random effect GLS regression
=> HR , ENV , CIN, scores have a negative impact in the long run on ROA when we do not correct for endogeneity

=> HR , ENV , CGOV, CIN and CS scores have (individually) a positive impact in the long run on ROA when we correct for endogeneity

⇔ In the long run, accounting for endogeneity , ESG scores have a positive impact on CFP (?)

Preliminary results

Test 3: Complementarity of ESG practices

Dynamic panel data estimation, one-step system GMM
=>HR : negative impact; CGOV and CS : positive impact in the long run on ROA when we correc for endogeneity

=> The complementarity of ESG policies matters in the long run reltionship between CSP and CFP

Summary and conclusion

SUMMARY OF RESULTS

NEXT STEPS

Summary and conclusion

In the short run

Short run cost of HR and ENV, short run benefit of CGOV ? – robsutness checks in progress

In the long run

Accounting for endogeneity , ESG scores have a positive impact on CFP (?) – robsutness checks in progress

The complementarity of ESG policies matters in the long run relationship between CSP and CFP

=> dynamic trade-off

Summary and conclusion

Next steps

Theoretical model :

- Supermodularity of ESG practices
- Testable predictions

Econometric analysis:

- Introduce more control variables (CFP etc.) and more performance measures
- Test the dynamic relationship CSP -> CFP (lagged variables)
- Test the robustness of the complementarity between ESG practices